

CAMPUS TECHNOLOGY

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October 2004 \$9

3D Vision

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Robert Templin saved
a **floundering SIS**
implementation by
re-examining mission

Cisco Grabs Campus VoIP

Defending IT Spending

Are We Punishing
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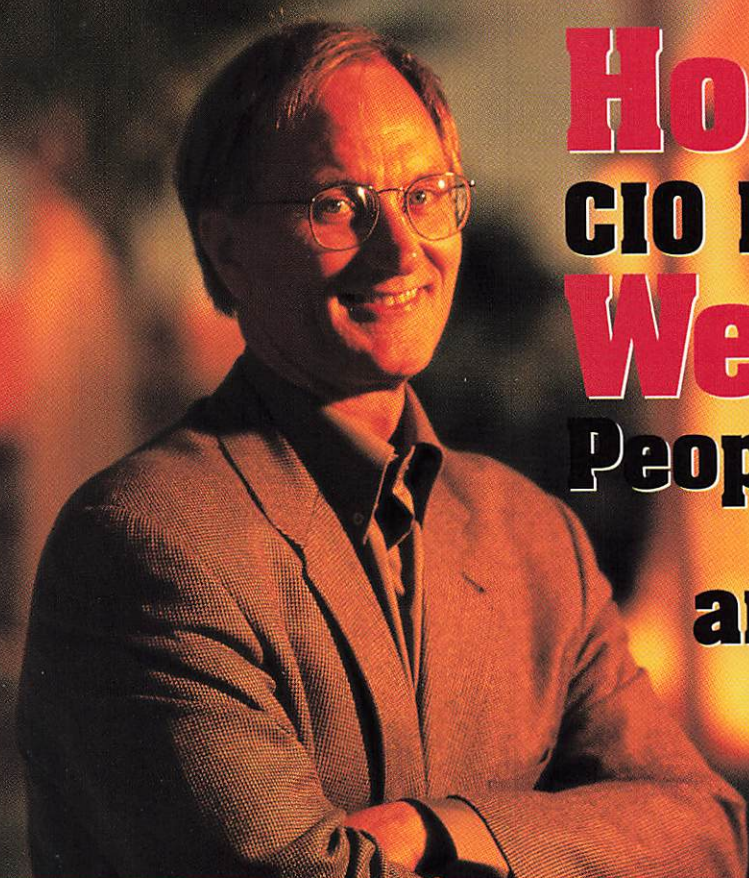
Top 10 Networking
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How CIO Ron Danielson Webified PeopleSoft and Won

PHOTOGRAPH BY ALAN BLAUSTEIN

A Triple Play of Bandwidth Savings, Increased Server Capacity and Extended Life Cycle.

THE IDEA was to provide more widespread access to business-critical enterprise applications without increasing the administrative burden on the IT department. Before that goal would be realized, however, Santa Clara University (SCU) got a lesson in what can go wrong with Web-based applications and, more importantly, how to remedy the problems.

In July of 2002, SCU made the move to PeopleSoft 8, the Web-enabled version of the popular application suite. The school uses PeopleSoft to support human resources, financial and student administration applications, including admissions, financial aid and course registration programs, says Ron Danielson, chief information officer for SCU, an 8,000-student university in Santa Clara, Calif.

"As much as we possibly can, it's our intention to push access to administrative information out to students, faculty and staff," Danielson says. With the previous version of PeopleSoft, that was a challenge because it required client software on each user's desktop. "With the Web front end, anybody with a browser can come in and get access."

Access they did, so much so that the university's application servers were overloaded and performance was much slower than with the previous version. "We were one of

the first half-dozen universities in the country to upgrade to PeopleSoft's new Web-based product, and we thought we'd spec'd out our network and equipment adequately to meet our performance needs," he says. "But we weren't even close."

IN SEARCH OF A FIX

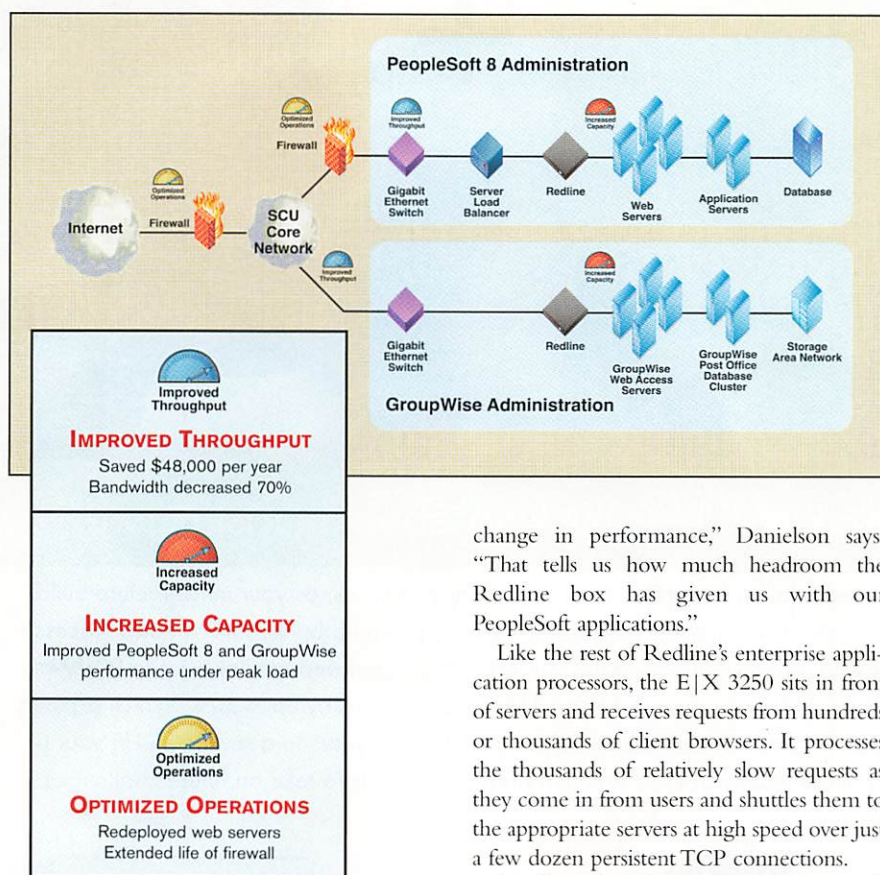
Initially, Danielson and his staff tried throwing more hardware and software at the problem. To an initial configuration of one Web server and one application server, they added three more Web servers and one new application server. They also brought in performance management and software tuning tools, and changed some PeopleSoft parameters related to processing input from users.

"This brought performance to an 'acceptable' level," Danielson says. "But now we had six servers instead of two, and we were still spending a lot more time on the problem than we would have liked."

In the fall of 2002, the university learned about Redline Networks of Campbell, Calif. Redline makes a family of appliances designed to improve Web-based application performance by offloading from the server I/O processing and connection manage-

SCU'S REDLINE BENEFITS AT A GLANCE:

- **Bandwidth reduction:** E|X 3250 reduces bandwidth requirements by up to 10M bit/sec, saving SCU at least \$48,000 per year.
- **Increases server capacity:** Offloads connection management, I/O and SSL processing, essentially cutting server loads in half.
- **Reduces number of network components:** Reduces the amount of data traffic, enabling network components such as firewalls to handle more load.



ment chores, while compressing content to conserve bandwidth. The appliances also handle Secure Sockets Layer (SSL) processing, thus serving to improve security.

LESS BANDWIDTH, MORE PERFORMANCE

In November, SCU installed one of Redline's E|X 3250 appliances and saw an immediate, dramatic improvement. Bandwidth usage associated with the PeopleSoft applications plummeted by 70%, thanks to the compression features inherent in the E|X 3250. At the same time, because the E|X 3250 handled connection management chores and I/O processing, server capacity effectively doubled.

The magnitude of server capacity and performance improvements hit home when one of the university's servers went down for more than a week. "We didn't even notice a

change in performance," Danielson says. "That tells us how much headroom the Redline box has given us with our PeopleSoft applications."

Like the rest of Redline's enterprise application processors, the E|X 3250 sits in front of servers and receives requests from hundreds or thousands of client browsers. It processes the thousands of relatively slow requests as they come in from users and shuttles them to the appropriate servers at high speed over just a few dozen persistent TCP connections.

"As far as the Web servers are concerned, they have a single connection, which is to the Redline box," Danielson says. The servers no longer have to perform complex scheduling of requests arriving randomly over a large number of connections. Instead, they service each response as it arrives and send information back to the enterprise application processor, which delivers pages to the client browser at whatever speed the browser can efficiently handle.

The E|X 3250 worked so well for SCU's PeopleSoft implementation that the university soon installed an additional unit to improve the performance of Novell GroupWise servers that provide Web-based e-mail access. Here the E|X 3250 sits in front of four servers, performing load balancing, connection management and compression. For its GroupWise application, the university also takes advantage of the E|X

3250's SSL offload capability, which obviates the need for the servers to maintain large amounts of user data, including client certificate information. It also ensures that end users have no direct access to the application servers and the often-sensitive information they contain.

Results from the GroupWise implementation have been similar to those for PeopleSoft: bandwidth consumption on the university's WAN links has been cut in half and response time has improved.

SAVINGS, SAVINGS, SAVINGS

The bottom line, Danielson says, is that the Redline appliances enable SCU to realize savings in three areas: bandwidth reduction, increased server capacity and extended life cycle of other network components.

Bandwidth savings come from the compression features of the appliance, which are browser-aware to adaptively compress content for each requesting user and never require specialized client software. The features save 6M to 10M bit/sec of bandwidth, which Danielson says would cost the university an additional \$4,000 to \$5,000 per month.

In terms of server capacity, Danielson figures he could remove two of the four servers supporting his PeopleSoft implementation without suffering a performance hit, although he has opted to leave the installation as-is to allow for anticipated growth in the number of applications and users. Similarly, on the e-mail side, "We probably won't have to grow that server farm dramatically to handle additional load," he says.

Just as the Redline appliances enable him to get more life out of his servers, they do the same for network components such as firewalls. "With the Redline box reducing bandwidth usage, there's less for the firewalls to examine," so a single firewall can effectively handle more load.

In coming months, SCU will be adding to its Redline implementation another server group that supports university financial applications.

To sum up, Danielson says, "This box delivers on all its claims."

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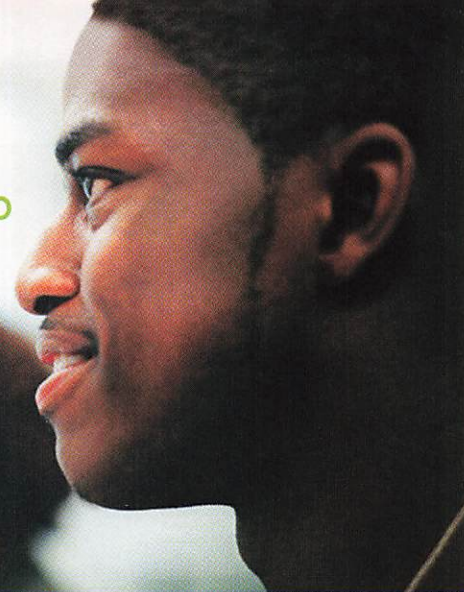
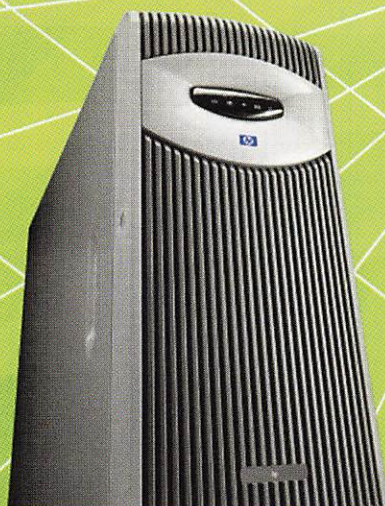
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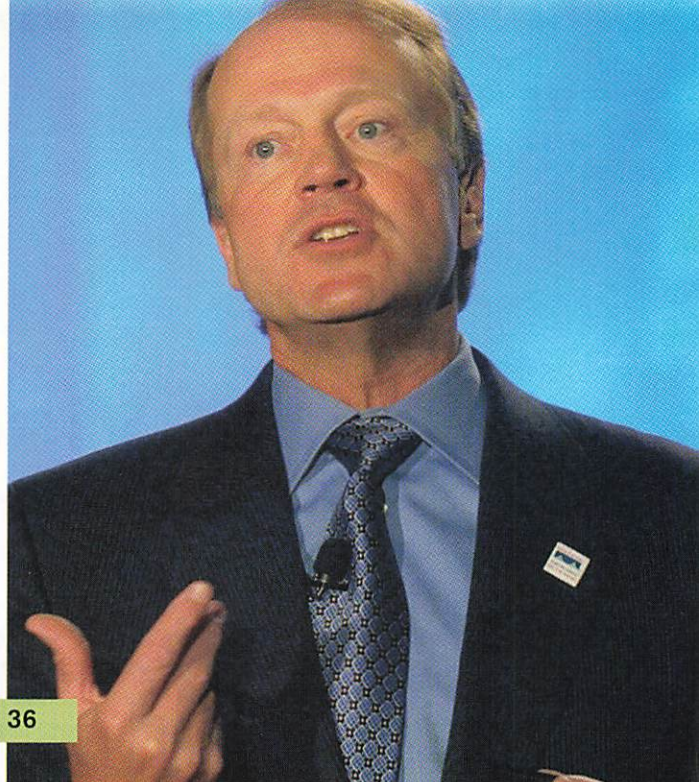
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On 3D Vision

Both campus presidents and technology magazines need to see beyond purchase-and-deploy.

When art director Scott Rovin and I decided to photograph Northern Virginia Community College president Robert Templin for our *Campus Technology* launch issue cover, we asked him if he would brainstorm with us about his interview for our enterprise technology story, "Enterprise Vision," page 28. We had been struggling to come up with a visual image around the marriage of strategic planning and enterprise technology, and we thought: If only we could get hold of some kind of phrase or concept that would give us the spark needed to get our creative juices flowing. Dr. Templin didn't disappoint us.

He spoke first about the need to link NVCC's enterprise initiative to needs larger, more urgent, more *dimensional* than the apparent technological requisites—the school's mission to support dramatic growth in campus diversity, among other things. And he spoke of strategic vision, a phrase that has been bandied about entirely too often in recent years, but a concept that this president "got" and believed the campus community had to "get," or else perish.

All at once, we weren't talking about enterprise technology any more; we were talking about enterprise vision. Dimensional enterprise vision. Scott and I probably had the same idea at the same moment, and when we ended the conversation with Dr. Templin, I said, "Wouldn't it be great if we could see those enterprise 'dimensions' with the glasses they used to hand out at 3D movies in the '50s?" Scott's a lot younger than I am, but he knew exactly what

I was talking about, and half an hour later, he had tracked down a vintage supply of 3D specs on eBay, just waiting for some fool magazine editor to purchase for a photo shoot.

That is why your first issue of *Campus Technology* sports a college president surrounded by a diversified campus community which, with his help, can now understand the impact of well-integrated enterprise technology on the survival of the institution. Today, this technology not only marries previously disparate functions across the NVCC campus, but also across the larger 23-campus **Virginia Community College system**, allowing easy access by a diverse, even distant, body of applicants and students.

Why do I choose to open my first Seen & Heard column with the behind-the-scenes story of our cover shoot and Dr. Templin's "3D" strategic enterprise vision? Because it perfectly illustrates the need to have just that kind of dimensional vision about *all* campus technology—to see the imperative of campus technologies serving and supporting mission and strategic goals; to see these tools optimized across a campus and/or a system; to ensure they broaden access, bringing people and knowledge together. That is what *Campus Technology* magazine and eMedia are all about. As we morph from our venerable predecessor *Syllabus*, I can't think of a more fitting way to get that all-important message across. **CT**

—Katherine Grayson, Editor-in-Chief

What have you seen and heard? Send to: kgrayson@101com.com.

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Trust, but Verify

In the IT game of Who Do You Trust?

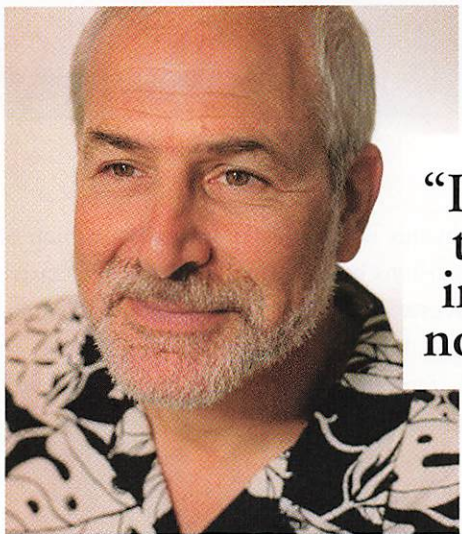
We may need more than a hope and a prayer.

However you feel about Ronald Reagan, there is no question that he truly was a Great Communicator. Reagan (and his handlers) could create or turn a sound bite into a phrase that would linger long beyond the moment. You may recall that in 1987, Reagan, citing an old Russian proverb, told Soviet Premier Mikhail Gorbachev that the foundation for the new US-Soviet relationship surrounding arms control would be “trust, but verify” (*doveray, no proveryay*). In fact, Reagan’s comment to Gorbachev has found life well beyond the context of the 1980s US-Russian discussions on arms control: Google cites more than 16,000 references

Who Can We Trust?

Speaking about his presidential colleagues and directly to the OHCCE audience, Garland noted that a key challenge confronting senior campus officials is, “*Who do we trust about IT needs?*” Noting that presidents and provosts “often lack the technical knowledge to evaluate proposals,” he stated that it is senior IT people who must translate technology options and vendor proposals into real and effective campus solutions. Garland’s public statement echoes the growing number of private conversations (rants?) about IT issues on campus and in higher education.

What, precisely, has fostered the “trust, but verify” mentality among college presidents, provosts, and trustees, not to mention many faculty?



“It is senior IT people who must translate technology options and vendor proposals into real and effective campus solutions—not presidents and provosts.”

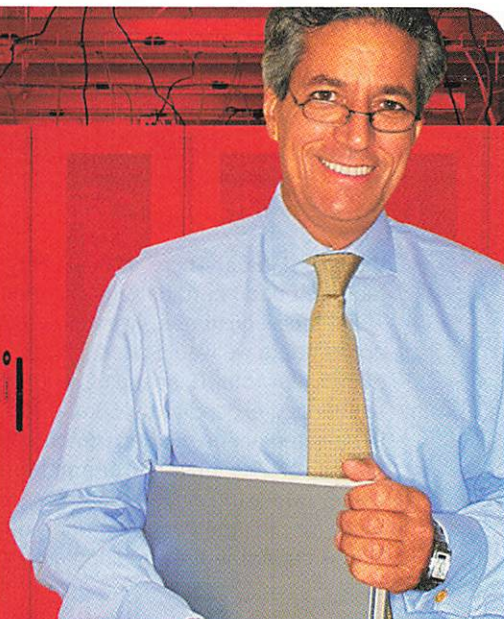
to “trust, but verify.”

Interestingly, in recent months I have been hearing that Reaganesque

“trust, but verify” theme, as senior campus officials discuss IT issues affecting their institutions. For example, “trust, but verify” was clearly the message that **Miami University** (OH) President James Garland offered to the 200 campus IT officials from Ohio colleges and universities who convened on his campus for the April 2004 Ohio Higher Education Computing Council (OHECC) conference. In his welcoming statement to the OHECC audience, Garland, a physicist by training, described himself as a “fan of good technology.” But, the best technology, Garland observed, “is that which you don’t notice, unless it is to admire its elegance or effectiveness. Unfortunately,” he added, “we’re still noticing computers—and not for their elegance or effectiveness.”

1—Tech consumes big bucks. Perhaps the most obvious factor is that colleges spend lots of money on technology: hardware, software, tech people, administrative systems, course management systems, digital content, campus Web sites, and more. Moreover, the decentralized nature of much of campus IT spending means that most colleges and universities probably need a small team of forensic accountants to unearth exactly how much campus money is actually spent on information technology.

That said, there are some general indicators for campus IT spending: data from the Campus Computing Project (www.campuscomputing.net) as well as from the EDUCAUSE Core Data Survey (www.educause.edu/core-data/) suggest that total campus IT spending now runs about 7 to 8 percent of institutional budgets—almost double the level that colleges and universities spent on IT in the late 1980s and early 1990s. (Alas, I’m not aware of any reliable campus IT expenditure data for



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the late 1980s. There are certainly “consensual estimates,” but no hard data for this period.)

2—Tech consumes everyone’s bucks. The forensic accountants we would need in order to get an accurate number for total IT spending would find that there are technology expenditures across the campus, not just in selected academic departments or for centralized IT services. The physics department needs its own server, while the photography program requires equipment for a digital darkroom. Individual faculty and individual departments pay supplemental fees for online

weeks and months following the terrorist attacks on 9/11, colleges and universities (like corporations and government agencies) incurred significant additional costs to address critical IT security and disaster recovery issues.

Is it any wonder, then, that Miami University’s Garland reports that he and his presidential colleagues feel IT costs are “out of control”? Admittedly, desktop and notebook computers cost significantly less today and do more than the products we purchased five or 10 years ago. But campuses are

“The ongoing investment in technology seems to lead to still more investments in IT—without documented enhancements in productivity, enhanced educational outcomes, or reduced costs.”

journals. Student labs and faculty computers may be both a departmental expense as well as an institutional expenditure. The emergence of internal service fees for network connections and user support contribute to rising technology costs and growing frustration about campus IT services.

3—Missing bang for the bucks? IT spending in the Information Age seems to run counter to the layperson’s “textbook” understanding about the link between productivity and technology. In the Industrial Age, investing in technology reliably led to reduced costs and rising productivity. In the Information Age (at least in education and on college campuses), many presidents and provosts feel that the continuing investment in technology for research, academic programs, and campus operations seems to lead to still more investments in information technology without the documented gains in productivity and educational outcomes, and without any reductions in IT or other costs.

4—Operating vs. capital costs. Because IT is really an operating cost as opposed to a capital cost, the continuing (and rising!) campus expenditures on technology required to support research, academic programs, and administrative services are an ongoing irritant for many senior campus officials, as well as for many trustees. The structural obsolescence embedded in hardware and software, coupled with annual licensing fees for system software and digital content services, means that colleges and universities are continually buying—and often buying more—technology.

5—Digital life in the new world order. Finally, in the

buying more computers, and more of other “stuff”—software, digital content, user support services, etc.—as well as upgrading aging, if not ancient, administrative systems (student information, finance, human resources, etc.) that, on many campuses, may be a decade or more old (according to the 2003 Educause Core Data Report Survey).

Managing Expectations

The lesson of the “trust, but verify” message may be a variation on the “do more with less, and do it better” mantra espoused by many college presidents during economic downturns. After all, in the case of IT, there’s no question that we are doing more, and we often are doing it better.

Yet, in addition to our efforts to control costs, we also may need to manage our IT aspirations and expectations. (One of the key lessons of the 1990s dotcom economy, for instance, was that the Internet changes many things, but not everything.) Consequently, for those of us who work in or with IT, the “trust, but verify” message means that while we can still trust with our hearts (“I believe in IT”), we will need to verify with our heads (document that the technology will produce and perform as promised). Our goal should be to align heart and head, aspirations with implementation.

To sum it up, we can certainly trust, but we also must verify. **CT**

Kenneth C. Green (cgreen@campuscomputing.net) is the founding director of the Campus Computing Project.

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Briefs

■ **DIGITAL DORMS.** At **Colorado State University**, students have moved into a brand-new dorm that boasts everything digital—from plasma TVs in the lounges and wireless everywhere (including the laundry room), to a computerized pass-key system that logs movement for security. Sporting a price tag of \$17 million, campus officials estimate that the finished structure comes in around 10 percent over more traditional dormitory structures, but it serves a new generation of students whose taste buds are primed for technology. ■ **ALL EYES ON IPODS.** Upper-classmen may be rolling their eyes at the half-million-dollar experiment that furnished every incoming fall freshman at **Duke University** (NC) with an iPod, but the new students are certainly not complaining. Duke junior Stu Tribbs, speaking in *The Chronicle Online*, a local independent daily, griped, “The use of \$500,000 to buy freshmen iPods is a gross misappropriation of university funds. Why didn’t they just work on keeping the network more consistent?” But Tracy Futhey, CIO and VP for Information Technology, defended the program to *Chronicle* reporters: “This is a good use of funds, since it lets us push the envelope a little bit and try new things.” The university plans to use the little gadgets in educational programs that will be developed under the original funding, and faculty have been encouraged to add audio elements to their courses. The cost of the experiment was covered by special funding for the university’s strategic plan for technology initiatives. ■ **INTERNET2 DAYS.** Bringing the value of high-end networking to the campus is about more than hooking wires together, and education is key. Internet2 schools (now numbering over 200) typically organize demonstrations called “Internet2 Days,” to promote understanding of the 10-gigabits-per-second Abilene backbone network. The **University of Arizona** will host its first Internet2 Day on November 4, featuring its uses of I2 across academic disciplines. Selected sessions will be multicast to the public. For more information, including how to join the multicast, head to computing.arizona.edu/internet2/internet2day.html.

Students expect plasma in the lounge and wireless in the laundry room.

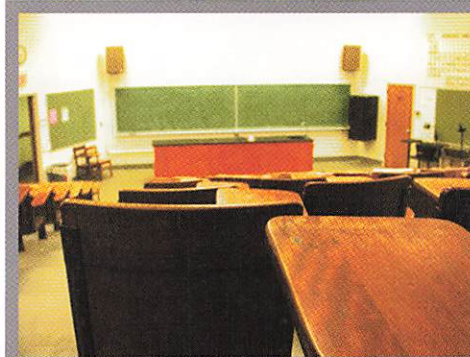


■ **KUALI PROJECT MOVES FORWARD.** Can a community source strategy do for ERP what Sakai is doing for CMS? **Indiana University**, the **University of Hawaii**, the National Association of College and University Business Officers (www.nacubo.org), and the open source solution provider r-smart group (www.rsmart.com) want to find out. They are pooling resources (including staff and services estimated at more than \$2.5 million over a two-year timeline) to develop a comprehensive suite of tools to serve colleges and universities, Kuali Project software (kualiproject.org), a new community source financial information system. It will be offered under a no-fee, open-open license agreement. To join the development effort, contact Barry Walsh (walsh@indiana.edu) at IU. ■ **ICAMPUS OFFERS ITS TOOLS.** An MIT-Microsoft collaboration to develop sustainable technology-enabled teaching models, tools, and Web services called iCampus (mit.edu/icampus) is entering its dissemination phase. The five-year, \$25 million project supports work on tools like Robot World (project-based engineering design); Magic Paper (natural sketching and pen-based interaction); TEAL (simulations and hands-on desktop experiments); XTutor (delivery of online lectures and automated tutoring); and more. The projects are not just for demonstration; MIT plans to disseminate the tools widely as each becomes production-ready. **CT**

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Quick
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(Feature available in September 04)



(Feature available in September 04)

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Network Type	Adhoc (peer-to-peer), Infrastructure mode
Ports	Analog RGB, Serial
Power	AC100V-120V (50/60 Hz)
Dimension	80 x 120 x 30 (mm)
System requirements	Microsoft Windows 98 SE, Me, 2000, XP
Recommended CPU	Intel Pentium 4, 2 GHz or higher
Recommended RAM	256 MB or more
Supported resolution	VGA (640x480), SVGA (800x600), XGA (1024x768), SXGA (1280x1024)
Screen capture method	Real-time video capture/One-shot image capture
Management	Web administration and configuration using standard web browser (Internet Explorer)

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2004 'Hot Buttons' in Higher Ed Technology

IT and academic leaders reveal what keeps them up at night—and what doesn't.

In the spring of 2004, a Syllabus2004 Executive Summit* survey of 52 higher education IT executives and professionals (director level and above) revealed the most pressing issues their institutions face in the administration of campus technology programs (see chart, right). Study participants represented medium-sized private institutions (29%), large publics (23%), medium-sized publics/state schools (19%), small privates (17%), and community colleges (12%) from the West Coast

Hot Issue for 2004	Ranked High/Highest Importance by % of Respondents
1. Course Management Systems	27%
2. Network Security/Privacy	23%
3. Budgeting/Infrastructure Replacement	13%
4. ePortfolios/Student Assessment	11%
5. Portal Technologies/eServices	9%
6. Enterprise Resource Planning	8%
7. Mobile/Wireless/Broadband	8%
8. Cost of Content/Publishing	1%

(44.5%), Midwest (33%), East Coast, and Southeast (22%), and Canada (.5%). Respondents titles were predominantly: Director-IT (23%), CIO (15%), Director-Academic/Instructional (12%), and VP/Vice Provost-IT (10%). Below, key highlights of the study, in priority order.

Will the OKI/SAKAI Initiatives Impact...

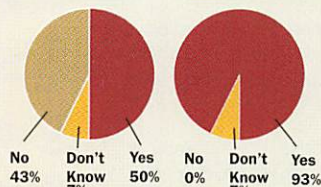
► **If CMS is so popular, why do so few faculty use it?** While 93 percent of colleges buy commercial CMS, only about 30 percent of their faculty use them to teach. Despite their acceptance, the systems aren't delivering the promised transformation of teaching and learning because of non-use.

► **Steep prices from CMS market leaders anger customers.** Price and scalability are the two top factors considered in the purchase of a CMS, but steep price increases from the major vendors have angered campus IT leadership. Said one participant: "At this point, we feel like we're being hijacked."

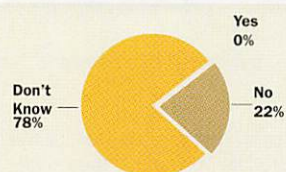
► **Open source community initiatives like Sakai offer software options and leverage against CMS vendor pricing.** Even though Sakai community source software is just coming onto the public market, participants suspect it is already having an impact in the boardrooms of commercial CMS vendors.

► **Denial of service and theft of data top security worries.** No one's data is as secure as it should be. Some colleges report stopping hundreds of DoS events and hacks daily.

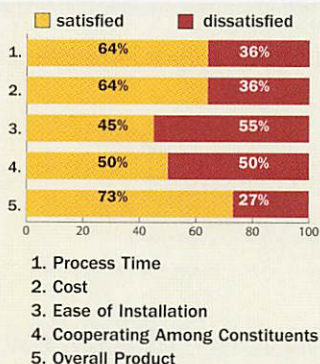
Your Institution? The Market Place?



Has eCommerce Improved ROI?



Satisfaction with ERP Systems Implementation



► **Will security hamper academic openness?** Some may confuse protecting information and network operations with constraints on academic freedom, but participants' comments reflect that they are acknowledging security issues: "Realities about openness are changing in the academic world."

► **Portals and eServices still elusive.** Participants say the promise of portals and eServices is unfulfilled. Providing single sign-on, role-based access, interoperability, and links to administrative systems are among the issues of concern. What's more, institutions don't know if their eCommerce solutions yield a positive return on investment.

► **Ubiquitous wireless is appearing faster than expected.** Last year, participants estimated it would be five to seven years before their campuses had full wireless coverage. This year, that estimate bumped up to three to five years.

► **Underwhelmed by ERP.** ERP took a backseat to most of the areas studied, surprising, considering the dissatisfaction with the implementation of these pricey, enterprise-level systems. **CT**

*Adapted from the Syllabus2004 Executive Summit Survey Report, "IT Issues and Strategic Viewpoints in Higher Education," July 18, 2004.

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Staying Power

When the outspoken M. Lewis Temares talks about priorities, it's security, VoIP, and—most of all—listening to his 'customer' that top his list.

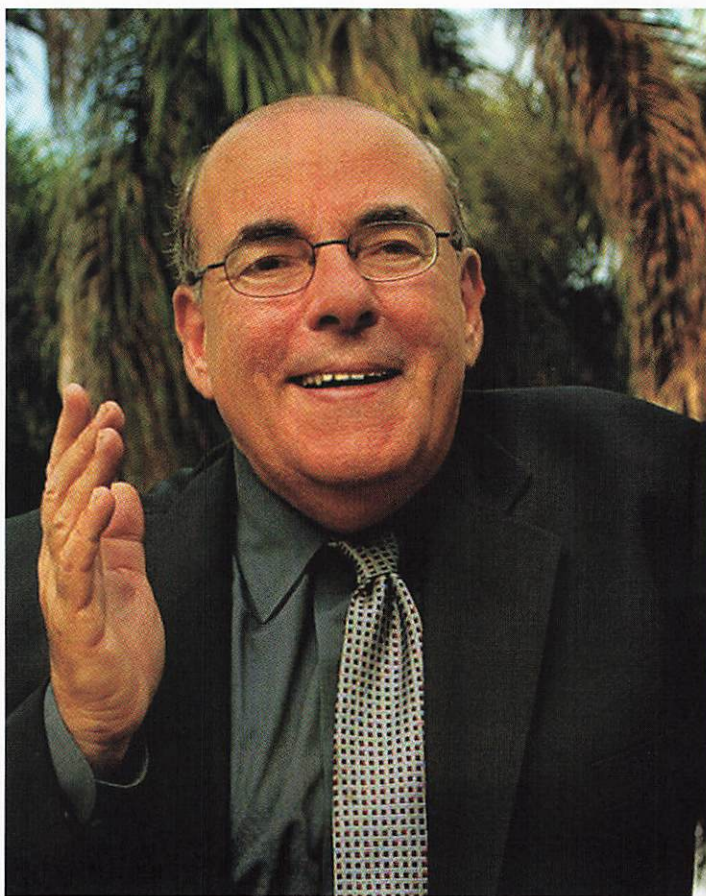
By Joseph C. Panettieri

There's nothing typical about M. Lewis Temares. As VP of IT at the University of Miami, Temares' track record as an IT professional is virtually unmatched in higher education. He joined the university in 1980, became the first CIO in higher education in 1989, and gained VP-level distinction in 1991. His keen focus on business continuity helps the university to survive fierce hurricanes, and his unconventional view of the software sector has saved the university millions of dollars in licensing and consulting fees (fees that Temares says he just can't justify). What's next for UM's CIO? Veteran technology journalist Joseph C. Panettieri, who first met Temares while reporting for *Information-Week* in 1993, recently spoke with him about his quarter century at the university, and his IT priorities for the 2004-2005 academic year.

Campus Technology: Most CIOs survive less than five years in the position. What's behind your longevity at the university?

Temares: In higher education, many people cringe when you use the word "customer," because it sounds so businesslike. But what better way is there to describe your students, your provost, your faculty, and your staff, than as customers of IT? You can call them "users," but that sounds terrible. With these thoughts in mind, I'd attribute my longevity as CIO to my organization's focus on our customers. We're always listening to them.

CIOs frequently struggle to establish strong working relationships with their university president and administration. Yet you enjoy a thriving professional relationship with UM president Donna E. Shalala. How did your mutual respect develop?



I've known Donna since 1971 when we met at **Baruch College** (NY); we also worked together at **Hunter College** (NY). I think the key to successful working relationships is aligning IT with the university's mission and broader goals. Accordingly, we have put together a bunch of advisory committees that meet and discuss IT priorities in a cordial, collegial way. For instance, we have a Business System committee and a Student System committee. They determine what they need in terms of application priorities. We are listening to them—our customers—all the time. Telecom and networking

requirements are slightly different challenges, though. In those cases, you need to know what your customers need because they don't have a feel for the bits and bytes of networking issues. They say they want access, but what they actually need is *secure* access.

Some CIOs struggle to gain access to the university's boardroom when critical IT projects are up for debate. Do you interact directly with the board of trustees?

For anything that involves a large IT purchase, or comprehensive planning and design that requires board approval, I'll present to the trustees.

What are your leading IT priorities for 2004-2005?

My biggest priority is security and secure access. We need to keep the system up, and avoid downtime related to things like distributed denial of service [DDoS] attacks. [A DDoS attack involves multiple PCs or servers flooding a Web site with traffic, thereby blocking legitimate users from visiting the site.] We're particularly

urging, and integrating are prohibitive, so we've stuck with a legacy system running Computer Associates' (www.ca.com) IDMS database on VMS. PeopleSoft is the leading candidate if we went with an ERP system, but it would be a \$100 million migration-and-integration project. Anyone who says less is lying. And we think the functionality would be less than the functionality we have from all the custom programming we've added to our current system.

So what business drivers would prompt you to modernize and embrace an ERP suite?

The decision shouldn't be made by the CIO. It should be made by a controller who says the staff doesn't have the tools they need to get the job done. (An uprising from the masses should direct you!) But there is no uprising about our applications, so they're fairly satisfied.

If the software market does consolidate, how do you see things shaping up?

The decision to move to an ERP suite shouldn't be made by the CIO. It should be made by a controller who says the staff doesn't have the tools they need to get the job done.

concerned about internal threats. Most universities celebrate when they enroll a top engineering student with a 1600 SAT. Yet that student can wind up being a brilliant, curious hacker. Every corporation has to worry about internal threats—but not as intensely as universities need to worry. Does Wal-Mart worry about an internal programmer taking down the University of Miami? Probably not. But do universities have to worry about students who will take down Wal-Mart? They certainly do.

What about specific apps? Regarding your student portal called EASY, what new services are you adding there?

We just added credit card support that allows students to pay for tuition. We had it some time ago, but gave it up because costs were too high. But as costs came down, we've ensured that all of our eCommerce efforts accept credit cards.

The enterprise market—Oracle (www.oracle.com), PeopleSoft (www.peoplesoft.com), and others such as Lawson (www.lawson.com)—appears poised for consolidation. Would consolidation impact your IT strategy?

We periodically review the ERP (enterprise resource planning) marketplace, but the costs of migrating, config-

Prices may go up when they consolidate. You can't negotiate without competition. Plus, the enticement to enhance systems is lessened without competition.

Let's talk convergence: Do you have voice-over-IP plans?

There's absolutely no question that voice-over-IP is the future. We use it in some remote facilities right now. But we already have a big investment in seven switches. Until we complete our return on investment with those switches, we won't make a broad move to VoIP. Plus, all the hacking you see today is done on data networks, not traditional voice networks. So with voice-over-IP, I'm concerned about security of telephony on IT networks. We've got a hospital and medical school; imagine if both their voice and data systems went down at once.

That brings us back to your big theme: Security.

Yes, security and—as I said—secure access. That's our big focus for 2004-2005. **CT**

Joseph C. Panettieri has covered Silicon Valley since 1992, writing for such publications as eWeek and InformationWeek.

What's Next for Windows?

64-bit enhancements could reshape your university's software strategy—especially if your 32-bit Windows servers are about to run out of steam.

DO YOU HEAR IT? It's that noise again. Every few years, Microsoft (www.microsoft.com) and the trade press start hyping a "forthcoming" Windows upgrade that will "forever change the world of computing." This time, most of the buzz involves Longhorn, code name for the oft-delayed successor to Windows XP that won't ship until 2005 or 2006 at the earliest. But while you listen for Longhorn-related updates from Bill Gates, be sure to ask your Microsoft reps and trusted integration partners about Microsoft's existing and forthcoming 64-bit enhancements to Windows.

My reasoning for this advice is rather simple: Microsoft's major server and desktop operating systems have relied primarily on 32-bit designs since around

1995. That's fine for everyday applications like Word, Excel, and even departmental server databases. But some universities are running up against the 4-gigabyte virtual-memory limit found in the 32-bit Windows design. By contrast, 64-bit Windows has a 16-terabyte virtual-memory limit. That's quite a difference: Each terabyte equals 1,024 gigabytes.

Sure, universities have been using 64-bit Unix operating systems from Hewlett-Packard (www.hp.com), IBM (www.ibm.com), and Sun Microsystems (www.sun.com) for a while. Each of those options offers rock-solid reliability and proven scalability—though you'll pay a premium for proprietary hardware. You can also embrace 64-bit Linux (www.linux.com) offerings—a solid choice—but that's not a campus wide option for universities hitching their software architectures to Microsoft's Windows-centric Net strategy.

Early Adopters and You

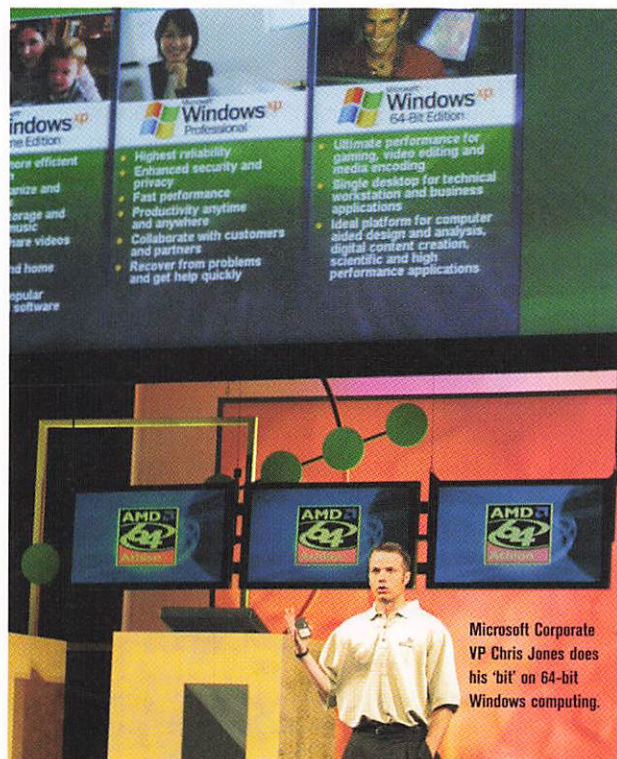
Although 64-bit Windows is still in its infancy, eager adopters include Johns Hopkins University (MD) and Cornell University (NY). According to a spokesperson for Johns Hopkins, researchers use 64-bit Windows to crunch complex computations—taking 10 days to compute a task that previously required up to six months using 32-bit Windows systems.

Similarly, Cornell uses 64-bit Windows in its Theory Center for "computational steering"—a technique that allows researchers to monitor and manage complex simulations in real time, using interim results to guide decisions about how to direct ongoing computation.

Those aren't everyday tasks, but your university may soon need 64-bit Windows for *mainstream* applications as well. Over the next few years, as your Web infrastructure grows to include portal, eCommerce, video, and voice-over-IP capabilities, your traditional 32-bit Windows servers may simply run out of steam.

Window Pains

Still, the 64-bit Windows puzzle is missing a few key pieces. Generally speaking, application developers



2:07PM _ LOG IN TO HOT SPOT

2:08PM _ NETWORK SECURES THIN AIR

2:09PM _ TRANSMIT SYLLABUS THROUGH THIN AIR

2:25PM _ GRADE MIDTERMS ONLINE

2:35PM _ SWITCH TO DECAF

The more freedom you give faculty and students to access information, the more they can collaborate and learn. That's good. But, at the same time, the more you expose yourself to intruders and worms. That's not so good. How far can a network travel to protect your campus? Now, the answer is everywhere. Cisco networks, with integrated wireless security, protect faculty and students who constantly move outside the safety of the campus network. So information is secured. No matter where it exists. To learn how universities and colleges have deployed secure Cisco networks, and the benefits they have realized, visit cisco.com/go/educate.
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such as Oracle (www.oracle.com), PeopleSoft (www.peoplesoft.com), and SAP AG (www.sap.com) offer limited (if any) 64-bit Windows products. Computer Associates International Inc. (www.ca.com) is banging the drum for its 64-bit database on Windows, but then, CA is a niche player in the database market. So far, the killer app for 64-bit Windows is Microsoft's own SQL Server database. Cornell and Johns Hopkins both run SQL Server in their 64-bit environments because, generally speaking, it's a lower-cost alternative to 64-bit Unix databases from Oracle and IBM.

My other short-term concern involves Microsoft's

To Intel's credit, the company has reversed course and adjusted its processor strategy to include 64-bit chips that run 32-bit applications without any performance tradeoffs. The new Xeon chips, known as Intel Extended Memory 64 Technology (or Intel EM64T), are available now with selected servers.

More Window Pains

In the meantime, 64-bit Windows and AMD's 64-bit Opteron processors should be a match made in heaven. But unfortunately, their nuptials have been delayed until at least the first half of 2005. That's when Micro-

The fun will begin when Microsoft ships SQL Server 2005 next year; the database upgrade will run on 64-bit Intel and AMD processors.

processor support. The software giant originally designed 64-bit Windows and SQL Server to run on Intel Corp.'s (www.intel.com) 64-bit Itanium processor (co-developed with HP). So far, so good—but here's where the trouble starts: Many corporate and university customers were slow to embrace Itanium because it ran existing 32-bit applications in "emulation" mode, an approach that often chokes software performance. Not surprisingly, some customers balked at that strategy. Some even ran into the open arms of Intel's primary rival, Advanced Micro Devices Inc. (www.amd.com). To AMD's credit, the company's 64-bit Opteron processors allow customers to easily mix and max their established 32-bit applications with next-generation 64-bit applications. AMD's hybrid approach proved so intriguing that IBM, HP, and Sun now offer servers equipped with AMD's 64-bit processors. Eager Opteron adopters and testers include the Universities of Michigan, Utah, and Tennessee.

YOUR 64-BIT OPTIONS

Linux	Widely available on 64-bit processors today and a natural choice for Web applications.
64-bit Windows	Today, only available for Intel's Itanium processor. Should support additional 64-bit Intel and AMD processors next year.
Unix	Widely available for proprietary RISC processors from HP, IBM, Sun, and others. HP-UX, a Unix variant from Hewlett-Packard, is also available for Itanium.

soft expects to finally ship Windows Server 2003 for 64-bit Extended Systems. The "Extended Systems" moniker means the Windows upgrade will run on Opteron or Intel Xeon with 64-bit extensions.

The real fun will begin when Microsoft ships SQL Server 2005 sometime next year. The database upgrade, which some universities are currently testing, will run on 64-bit Intel and AMD processors.

Admittedly, there's no need for you to stampede to 64-bit Windows. But you should speak with your applications providers to determine when they'll deliver 64-bit products. If your curriculum includes such areas as engineering, architecture, medical imaging, computer-aided design, graphic design, and other computer-intensive courses, then 64-bit workstations and servers may be a logical option.

And unlike some Microsoft programming efforts, I've got faith in the 64-bit Windows development team. Dave Cutler, the man behind Digital Equipment Corp.'s legendary VMS operating system from the 1980s, headed the initial Windows NT programming team in the early 1990s and quietly spearheads Microsoft's 64-bit Windows initiatives. Cutler was the central character in *Showstopper!* (Macmillan Inc., 1994), a witty and insightful look at the original NT development team, penned by G. Pascal Zachary.

With Cutler onboard, I have no doubt that Microsoft will continue to close the scalability gap between 64-bit Windows and Unix, leading to a final high-end showdown between Windows and Linux. **CT**

Joseph C. Panettieri covers Silicon Valley for this publication and others such as eWeek and InformationWeek.



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Where's the Value?

By Bennett Voyles

There are many ways to help your institution get a solid return on its IT investment. The question is: Are you actively employing any of them?

In the 1990s, information technology was often sold as a way to dramatically cut costs, yet as time went on, the proposition turned out to be difficult to prove. Sometimes the technology didn't function as promised. Other times, it did, but it required more care and feeding than anyone had initially imagined. Either way, the result was bigger payout for an uncertain—or at least not measurable—return.

Today, the situation is not all that different on college and university campuses. By and large, administrators still cringe when it comes time to write those huge technology checks. In fact, they may be wincing more today than ever before: In a 2004 Educause survey of 571 higher ed IT professionals, those surveyed rated IT funding as their number one concern, from a checklist of 30 top issues. The source of the crisis, say Educause analysts: "Quite simply, total costs for IT are increasing at a rate that exceeds the ability of colleges and universities to pay." But in spite of that, campus executives are often curiously unconcerned about quantifying the value of all that investing.

Why the lack of interest? Some say it has to do with how decisions are made on campus. Doug Allen is currently CIO for a Midwestern financial services company, but until recently, he was the long-time CIO of **Johnson County Community College** in



Missouri. "Decisions are made for a variety of reasons," says Allen, "and value isn't necessarily as important as 'alignment with strategic initiatives' or simply just keeping powerful people happy."

But that could be changing. To try to get a grip on ever-expanding IT budgets, some administrators are now experimenting with various measures to find out if IT dollars are being spent wisely. Though no single technique or tool provides a definitive solution to the problem, the range of measures in play indicates that there are now indeed a growing number of ways to understand and manage spiraling tech spending—and plenty of campus administrators keenly interested in finding out if they are getting the proverbial bang for their buck.

In the early years of the big IT bud-

decided some time ago that they needed a way to compare or "benchmark" IT expenses among colleges. Over 130 schools now participate in the COSTS (Capturing the Cost of Supporting Technology Services) Project (www.costs-project.org), launched seven years ago to ascertain what peer institutions were spending on IT, and how those expenditures compared. What Smallen and Leach have found is that there are numerous variables that affect the level of IT spending at any given institution. Not surprisingly, large research universities may spend more per student than smaller schools. Mission can also make a difference—an engineering school, for instance, may spend more on information technology than a liberal arts university. Yet Smallen says that he and Leach

Activity-based Costing

At **Indiana University**, IT budget planners were not as concerned with what their peer schools were doing, as they were with finding out how large-dollar IT investments actually pay off on the IU campuses, usage-wise. For years now, Indiana's IT administrators have employed "activity-based costing"—an accounting approach that, even in corporate America, is still in the test-pilot stage. Unlike traditional accounting methods that measure expenditures versus earnings, activity-based costing attempts to understand how much an activity *actually* costs.

Brad Wheeler, associate VP and dean of Information Technology at IU, says performing activity-based costing is quite low-tech and only involves a

"Activity-based costing has helped us make better IT decisions." —Brad Wheeler, Indiana U

gets, says David Smallen, VP of Technology at **Hamilton College** (NY), college and university administrators didn't squawk at a sizable IT investment because they weren't looking at technology as an ongoing expense. "They would say, 'I don't understand anything about it, but we need to buy some stuff. As soon as we buy that stuff we'll be all set,'" he recalls. Eventually, however, administrators began to realize that IT spending was just like any other institutional spending: No campus is ever "all set."

Start with Benchmarks

"What everyone now realizes is that this is like any other fundamental part of the institution," Smallen says. "When you put up a building, you've got to plan for replacing the roof and updating or replacing the structure every 30 to 40 years. Technology is on a more rapid cycle, but the concepts remain the same."

To begin to get some sense of what IT expenditures should look like, Smallen and Karen Leach, Hamilton's CFO,

have found a few propositions that generally seem to hold true: First, most institutions currently spend between 4 to 6 percent of their total budget on information technology. Second, roughly half of that budget is spent not on software or hardware, but on salaries.

For their participation in the COSTS project, institutions receive highly detailed information regarding how they compare to their peers. Nitty-gritty details include how staff are spending their time: In the 2002/2003 survey, for example, it was revealed that 15 to 30 percent of IT staff time is spent supporting infrastructure, 20 to 30 percent is spent on enterprise system support, and only 10 percent on the faculty and student help desk. Such data might not provide all of the answers to curtailing spiraling technology spending, but Smallen says that the information can be helpful in shaping the campus discussions that will lead to better-informed spending. "It's not as though you look at the data and the answer pops out," he says; "more likely, it raises the questions you should be asking."

series of Excel spreadsheets. Instead of relying on automation or detailed logs, managers are simply asked to estimate how much time their staff spends on a given activity, in order to generate a cost estimate of its expense. Once managers determine what staff and resources are used for a given activity, they then divide that by unit cost, estimate in percentage terms which groups or departments on campus use that service, and then allocate costs accordingly. Total cost of IU's activity-based costing method is the equivalent of one full-time employee a year, according to Wheeler—not bad when you consider that the university's IT group spans eight campuses and operates on a \$100 million budget.

But does activity-based costing work? There are no hard numbers available, but Wheeler says that the system (in force since the late '90s) has helped administrators make far better IT investment decisions than they could have otherwise. The challenge of activity-based costing, says Wheeler, is more political than logistical. "It's just a mat-

ter of the will to do it, and then doing it," he says. But don't perform this kind of costing exercise just once, he cautions; its real value lies in comparative analysis. "For us, the key is year-over-year tracking. If you're going to do it, you've got to do it consistently," he says.

IU now makes all of its activity-based costing records available to the public at (ovpit.iu.edu/fo/rates). "The site gets a lot of hits from folks in other places who are pondering their own IT decisions," Wheeler says.

Looking at TCO

Then there are the proponents of employing "total cost of ownership" (TCO) calculations to discover what technology actually costs an institution.

tallying any hidden (or even not-so-hidden) expense can be a challenge.

William Riffée, dean of the College of Pharmacy and associate provost for Distance, Continuing, and Executive Education at the **University of Florida at Gainesville**, admits that he has little faith in such exercises. He adds that he wishes there were an Excel spreadsheet or a program that could reveal how much something actually costs to own and operate. But, he says, in academia, there isn't. "We have enough trouble figuring out whether we've paid people this week," says Riffée.

Uncover Value

Pradeep "Peter" Saxena, CIO of **Roberts Wesleyan College** (NY), takes a some-

support for the IT spending priorities the institution has chosen.

Survey for Value

What makes collegiate accounting more complex than that of private industry is the fact that it's sometimes hard to isolate a single bottom line—there are so many bottom lines. As a result, some administrators are now striving to quantify how their technology investments affect the students.

Kathie Sigler, provost of **Miami Dade College** (FL), likes to use a poll to show how her college's IT investments have helped the largely low-income and minority student body overcome the "digital divide" many social critics see between the country's

"I beg well. I tell the story of our students and their need." —Kathie Sigler, Miami Dade College

With TCO accounting, cost of purchase, upgrades, maintenance and support, and other variables are figured into the mix to yield a clearer picture of true value and return on investment after the TCO has been subtracted from the benefits generated. Total cost of ownership is a concept that was developed by Gartner (www.gartner.com) IT analysts in 1987 to help corporate America get a better picture of real hardware and software ownership costs. Now in common use in business worldwide, its application is so ubiquitous that tech companies routinely offer calculators on their Web sites to help prospective purchasers estimate TCO prior to purchase. Indeed, many technology vendors encourage TCO examination; they believe that in many cases it helps to close a sale. It is not uncommon during such exercises to discover that a sizable technology expenditure is suddenly revealed as more logical and contained than a smaller one likely to spin out of control with open-ended support, maintenance, and upgrade fees.

Still, there are critics of the TCO methodology, many of whom hail from the world of higher education where

what different approach to estimating the value of IT. Rather than leaving the job to the accountants, he takes a Socratic tack with staff and faculty, to show them the value they're realizing from the institution's IT investments. The idea, he says, is to overcome one of the central problems (and, paradoxically, the goal) of information technology: namely, that when it works, it's invisible. "People don't remember the 999 times it worked," he says. "But they certainly remember the time it didn't."

To encourage faculty and staff to think about the value that the institution's IT investments have created, he asks groups to jot down what they do during the day, then list all the information systems and services they use to execute those tasks. In addition, Saxena includes faculty on committees that are making purchasing decisions. He says that this can be useful not just for ensuring that a new package meets faculty needs, but to help build support for whatever IT investment is made. Creating such consensus doesn't always translate into dollar value, he says, but it does ensure that there's broad-based

haves and have-nots. To prove that the college's IT spending has made a difference to her students, Sigler polls them on their use of computers, and their attitude toward them. Sigler's polls show that computer ownership among the school's 165,000 students has skyrocketed, over the past five years. In 1999, 61 percent of all students had a computer. This year, that figure rose to 91 percent, and among black students, the numbers jumped from 47 to 83 percent. Just as importantly, says Sigler, her polls show that at Miami Dade—an institution where many students face challenges bringing their capabilities up to those of four-year college students—91 percent of students now describe themselves as "comfortable" using computers.

Lower the Cost

Another way in which Miami Dade's Sigler improves her school's value for IT dollars spent is by finding ways to get around paying for some of it. Sigler (a regular at Comdex) routinely asks the country's biggest technology companies to donate products or to use her students to test them. Even Bill Gates

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has heard Sigler's pitch a few times.

"I beg well," she says, and "I tell the story of our students: what their need is, why they're very deserving; how we need to help them. I can make people feel really guilty about that." Guilt, as

it turns out, is an approach that's keeping her school on the cutting edge.

Thinking Outside the Box

Finally, the most counterintuitive of the creative approaches to keeping technology costs in line with value received may be to try to think less about technology and more about the school and how it functions—or *doesn't* function. IT analysts have long held that focusing exclusively on the technology is a sure way to spend ineffectively, and many higher ed observers are now agreeing.

Ed Barboni, an information technology consultant for the Council of Independent Colleges (www.cic.org), says that the approach most colleges have been taking toward information technology is similar to the unsuccessful technology-will-solve-all-our-problems approach so many corporations took for the better part of two decades, when executives focused simply on automating function without an eye to process change.

That approach had a serious drawback, according to Barboni: It turned out that automating without re-thinking process didn't save any money—in fact, in many cases, trying to customize technology to suit existing processes drove technology costs through the roof. Eventually, managers discovered that they needed to first assess and then reengineer their *processes* in order to see real improvement and cost savings from the technology. Once that realization hit home, says Barboni, technology ROI was dramatically improved.

Yet this kind of process-first thinking is still limited in colleges and universities, he explains, held back by turf wars and an inability to make collective decisions. Certain schools have begun to simplify processes on the administrative side of the institution, he adds, but on the academic side, he sees far less progress.

One standout is the **Carnegie Mellon** (PA) Open Learning Initiative (www.cmu.edu/oli), which creates study materials based on research around how

people actually learn. Then there is the recent rollout of the Program in Course Redesign run by the **Rensselaer Polytechnic Institute** (NY) Center for Academic Transformation (www.center.rpi.edu). Funded by a grant from the Pew Charitable Trust, the Course Redesign Program created 30 pilot projects over four years at schools across the country, to show that technology, carefully applied, could improve learning and reduce costs in areas as diverse as chemistry, Spanish, and art appreciation. The pilots, focused on improving outcomes in mammoth introductory courses, introduced tools such as online study guides that provide immediate feedback to students. As a whole, the endeavors succeeded spectacularly: instructional costs were slashed by nearly 40 percent overall and learning outcomes improved in 25 of 30 programs. As a result of what they've learned about combining process change with academic technology, says Carolyn Jarmon, associate director of Rensselaer's Center for Academic Transformation (www.center.rpi.edu), RPI can now show schools what works and what doesn't.

Step Back, for Value

Moving forward, it is clear that colleges and universities are going to be held more accountable for their IT spending snafus than they have been in the past, as too many areas of the institution are being negatively impacted by poor IT purchasing decisions. Contrary to past activity, the solution does not necessarily lie in "bigger and better" replacement purchasing, but in a better-informed sense of technology options and their value and suitability for the mission, process, and culture of the institution. In other words: The time to step back and evaluate the intrinsic value of your installed technology is now. What you learn will color future technology purchasing decisions. **CT**

Bennett Voyles is a New-York based business and finance writer.

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- ▶ Are we evaluating its effectiveness with users as well as technologists?
- ▶ Are we achieving optimal usage of our technology? (Or is it underused? Are we over-purchasing?)
- ▶ Do we poll or survey users frequently to see if the technology meets or exceeds expectations?
- ▶ Do we have more than one way to determine return on investment (ROI)?
- ▶ Do we approximate ROI prior to purchase?
- ▶ Do we determine total cost of ownership (TCO)?
- ▶ Do we approximate TCO prior to purchase?
- ▶ Do we determine "cost to perform activity" with—and without—the technology?
- ▶ Are there other ways we can attract technology to the institution, without dollar investment?
- ▶ Do we know what are the true costs to us—"hard" and "soft"—of technology that does not meet its promise?
- ▶ Are we assessing and evaluating process before we look at technology solutions?
- ▶ Are we internally "marketing" the real value of processes that have been improved through technology?

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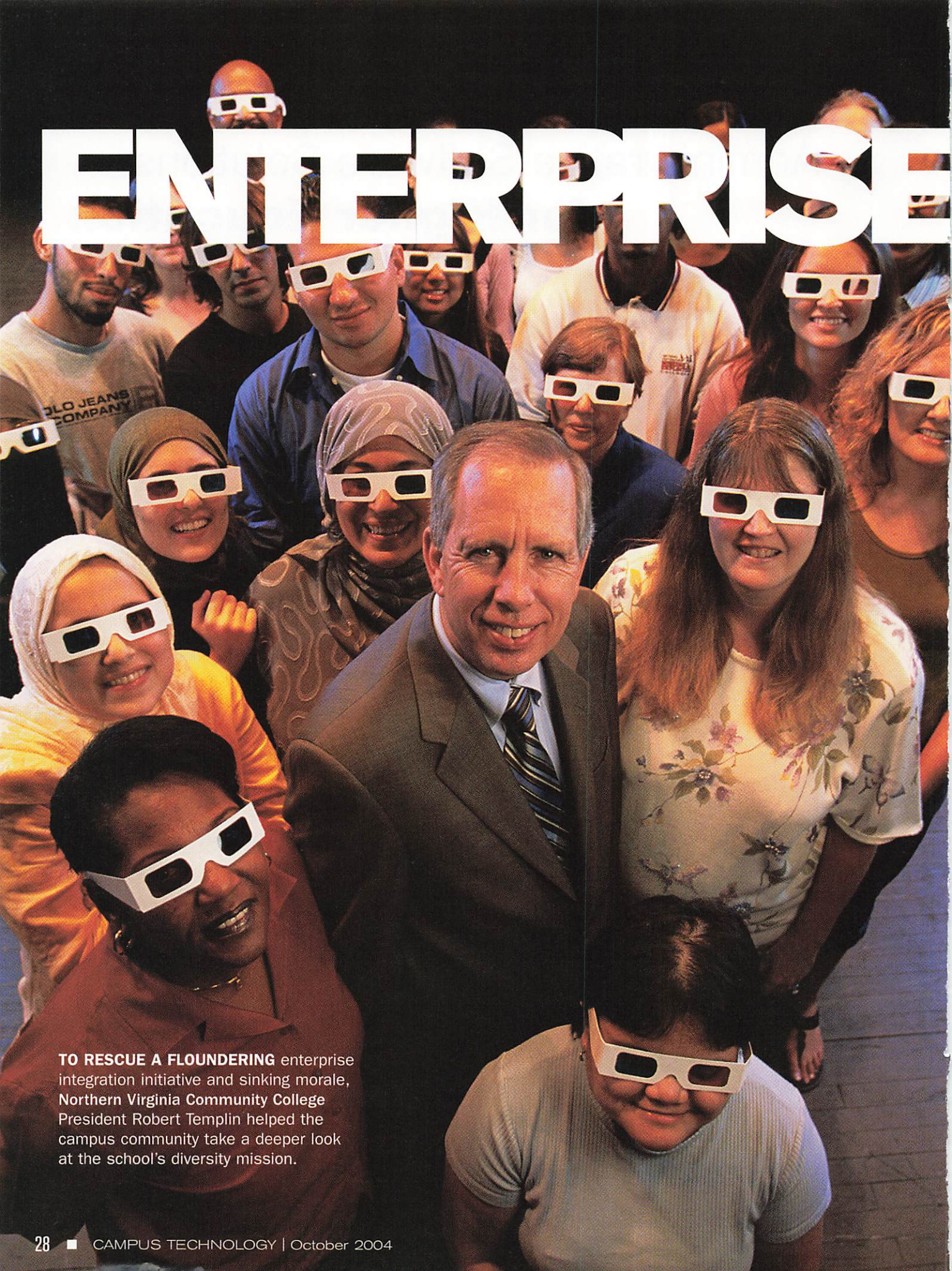


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TO RESCUE A FLOUNDERING enterprise integration initiative and sinking morale, Northern Virginia Community College President Robert Templin helped the campus community take a deeper look at the school's diversity mission.

VISION

by john savarese

The difference between an enterprise technology implementation that soars and one that dies a painful death is planning, people, and—most of all—vision.

There is nothing quite like an integrated information system (IIS) project. In fact, you haven't really earned your stripes until you've been through one. Simply put, the IIS project is not for the faint of heart. There are those who will switch jobs just to get the opportunity to lead IIS projects, and there are those who will retire early, just to avoid taking part in one.

IIS projects can make careers, or they can burn out a whole series of leaders over several years. They can produce headline-making increases in efficiency, or they can tally up awe-inspiring cost overruns. What determines success or failure? If there is a single crucial factor, it is the recognition that IIS projects are about integrating campus functions, not just about technology or software. That is why top-level planning must play a key role; *that is why the project has to be tied to institutional priorities.*

Examine the Planning Process

If you want your IIS project to succeed, it will pay you to study the top-level planning situation at your campus. Knowing how that planning process works—or doesn't work—in your institution can help smooth the way for IIS and similar projects, and can alert you to obstacles that your project might stumble over. If the campus planning process isn't what it should be, you can add elements to your integration process to make up for the planning deficiencies and make your project more stumble-proof. Here's how IT professionals and campus administrators at the heart of enterprise integration in diverse institutional types with different planning cultures have met their own challenges.

Northern Virginia Community College:

Turning around a troubled project and low morale

The student information system project at Northern Vir-

ginia Community College (NVCC, or NOVA, as it is often called) was in serious need of rescue. Over five years of planning and work had been spent on implementing an integrated PeopleSoft (www.peoplesoft.com) student information system (SIS) across the 23-college Virginia Community College system, and the largest VCCS institution by far, Northern Virginia Community College, was still not on board. One deadline after another had passed, and the cutover had been postponed for the third time. Morale was low and fear of catastrophe haunted many of the participants.

That fear was well-founded. Serving over 60,000 highly diversified students across five campuses, and with a medical education center slated to come online, NVCC was virtually a system unto itself. While the smaller community colleges in the state system might have been able to glide over the rough spots by using temporary manual systems, the registrars, advisors, financial aid specialists, and business office managers at NVCC knew that switching to a system that did not work flawlessly might do serious harm to the college.

Countering fear and cutbacks. NVCC's new president, Robert Templin, understood that "harm" was not just a matter of paperwork that might fail to get done. The very concept of increased integration and imposed uniformity posed a threat, he acknowledged. "NOVA is celebrating its fortieth year," he explains now, looking back. "It has developed a culture. It looked like we were about to implement a technology that people feared would destroy all our traditions."

Still, Templin had to deliver the news that there was something much worse to fear: The diversified community that the college serves had expanded by 350,000 residents in 10 years, and to meet the needs of that community and continue to support the school's mission of access, the college needed to grow by 25,000 students, add two campuses, build one million square feet of new facilities, and raise \$100 million.

Unfortunately, the week that Templin started as president, he was handed a \$9 million budget cut. Help from the budget-strapped state of Virginia would not be forthcoming.

The message from the new president to the college community was, "Old solutions like 'Do more with less' won't work. We have to fundamentally reconceive how we do our work." That meant integrating new technology tools into teaching and learning to make more effective use of facilities and faculty. It meant growing more non-traditional learning experiences for students who came from all walks of life.

Yet, he pointed out, none of that could happen unless, at the same time, the college made the transition to a new environment for student information systems; the old system should not keep up with student information coming in from far and wide, and was in danger of

restricting access, not fostering it.

Reinvigorating and empowering. Under a new flag, Templin reinvigorated the entire SIS project, and at the same time, moved the college's mission of diversity forward. Instead of being known as a technology project that kept running into technical and procedural snags, the SIS initiative became a life-or-death project for integrating and streamlining central college services. Then Templin placed the (somewhat surprised) chief academic officer, Hortense Hinton, in charge of the project. (Hinton is now provost of the Manassas campus of NVCC, but was then the interim chief academic officer and VP of Student Services.) The IT organization was reassigned to a support role, charged with enabling the work of the new committee that represented functional users from across the college.

What Templin did was nothing less than endow the student information system committee with real authority to take action. "At one meeting, someone referred to us as the 'all-powerful SIS committee that is changing this institution.' I had no *idea* we wielded such power," laughs Hinton. "All I knew is that we had a charge to get things done."

The people part. Part of the SIS committee's effectiveness came from its organized effort to involve everyone through a formal communication plan. Town meetings, a Web site, and collaborative planning exercises brought people together to deal with the differences in how they did business.

Hinton says that she now sees that her personal people skills were at least as important as her executive title. "I was encouraged to use my abilities to reach out to people, to deal with motivational issues and anxiety as much as with the technology, skills, and training issues. My background in counseling and my coming from student services helped me there. I had been on both sides of the house." Yet, even she admits that none of those efforts would have worked without some changes in the strategic and institutional planning structure.

"The constant in all this," Templin

maintains, "was the horizon that we fixed through our strategic planning."

Strengthening the strategic planning process—and the project. Hinton notes that Templin's strategic changes also "fixed" a real disconnect in the existing collegiate strategic planning process. Prior to her heading up the new SIS committee, she says, "I had served on the planning committee, which was made up of many college representatives. But the real decision-makers," she recalls, "were the Administrative Council, the provosts of the campuses, and the vice presidents, not those of us sitting on the unwieldy planning committee." The new president elevated strategic planning to the Administrative Council, defined a clearer relationship between the division deans and the vice president who represented them on the council, and brought the institutional researcher into the council for strategic planning purposes.

This realignment gave strategic planning a more effective role in guiding college decision-making. It also meant more overlap between those performing college planning and those who were coordinating the SIS project.

Moving forward. The new student information system finally did go live at NVCC, with an enthusiastic IT team right behind it. This fall, it registered nearly 5,000 students in a single day using the Web and IVR (interactive voice response)—the largest number ever registered in a 24-hour period.

"We're connecting with students from all over, and moving forward our mission of diversity," says Templin. "Old work processes are dying; new ones are being invented. Sometimes there are workarounds; sometimes students stand in line and overloaded servers crash. But we're pressing on, and it's getting better. Our eyes are fixed on the destination, not the bumps in the road."

Marygrove College:

Rescuing online study chaos

When Marygrove College (MI) initiated a distance learning version of its Master of the Art of Teaching (MAT)

▶▶ Lessons Learned: Credibility

James Alfini, Dean and President, South Texas College of Law

Understand the importance of the planning leader's credibility

South Texas College of Law went through both the development of a strategic plan and a new integrated information system (IIS) selection in the first year of James Alfini's tenure as dean and president. "Technology was not on our radar screen during planning," he realizes now. "But when I think about the process we went through, I realize it helped us develop a culture that allowed people to think across departmental lines. Everyone had been involved in brainstorming sessions on issues, informing others what they do and how they could be helpful to each other. People came to realize that they genuinely needed an integrated database." Lessons learned: "During planning, the leader's style is being tested for credibility. The content of the message could change, but other things come into play: your genuineness, your lack of guile."



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program, it was quickly overwhelmed by its success. While the undergraduate enrollment at the college was about 1,000, in a few months the new study-at-home program had ballooned to 2,500 students. For a college that has a long history and tradition of service to its students and to the community, the new program was straining the school's ability to meet its own standards. And as administrators were discovering, serving students who never set foot on the campus required a whole different set of resources. To meet the new program's demands, the MAT program was forced to borrow people from other departments to work part-time during the registration crunch; it was even recruiting senior citizens to help open the mail. The result was chaotic, says Director of Technology David Schulte.

"We'd have a case where a student was working with the books and videos, and would submit her work to the faculty mentor. But there would be no record of her having enrolled; the systems weren't in sync."

Integrating systems via improved strategic planning. The answer was to integrate the ad hoc systems that had been developed to administer the MAT program, into the Datatel Colleague system (www.datatel.com) that was

used for the on-campus undergraduate program. But the requirements of the two programs were quite different, and it took a year of effort to mesh the two. Aiding the challenging transition was the framework of strategic planning that had been developed at Marygrove—along with a systematic application of the Excellence in Higher Education program—*Excellence in Higher Education 2003-2004: A Baldrige-Based Guide to Organizational Assessment, Improvement, and Leadership* by Brent D. Ruben (www.nacubo.org). The job at Marygrove was not to develop a sense of institutional purpose and dedication to mission. That was already a strength of the institution, because of its history and heritage. Nor was the idea of broad participation in planning difficult to sell.

"This has always been a campus in which the faculty and staff have been participants in deciding what had to occur," says President Glenda Price. "People always want to be involved, to be consulted." The challenge, says Price, was helping people to develop the skills to make the needed changes happen.

The college created a managers' group (a formalized structure that had not been in place before), provided training for first-line managers, and conducted a business process analysis aimed at mov-

ing the entire institution toward online registration. The planning framework did not eliminate stress, however.

"We've lost some people," admits Price, "and in an environment like this, that is not easy; everyone is shaken up when we lose people. But we lost them for a variety of reasons: In some cases, people were not up to the task that was before them with the changes, or we redefined the jobs and didn't need certain positions any more. Yet because this was an open process, we talked to everyone, and nothing was hidden. So they knew what was happening and understood, even if they were not happy."

Fewer calls, less person-hours. Schulte notes that the MAT program used to be inundated with four-to-five thousand telephone calls a month, and manual entry of student registrations required 1,800 person-hours. With the new system, incoming calls have been cut by 50 percent, and now that students register online, the task of assigning students to cohorts is done via a batch process that takes just six person-hours. It's no surprise that with the changes, the program has now grown to 5,000 students. Most importantly, from an institutional strategic goals standpoint—service to students and community—students receive their study materials and group assignments much more quickly, and lost registrations are a thing of the past. Clearly, Marygrove's approach to their integration project was right for the college.

▶▶ Lessons Learned: Discussion and Consensus

James Brock, Dean, Sigmund Weis School of Business, Susquehanna University

Take the time for university-wide discussion and consensus

Susquehanna University (PA) business school dean James Brock was asked to lead a university-wide project to determine the best way to replace the campus's legacy systems, after the hardware manufacturer announced the end of support for the platform they were running on.

"We started our internal discussions early in the game, at a retreat," remembers Brock. "We became convinced that this was a healthy way to start, after we heard horror stories about IIS selection. We would visit another school, and there in the bowels of some building, the registrar would spill her story about how wrong things had gone with their selection of a particular system." Did SU's long period of planning end up making a difference? "Who knows?" admits Brock. "Could a committee of three have selected the same software package [Datatel; www.datatel.com], maybe a year earlier, with less self-examination? Perhaps. But I have the feeling that everybody feels their thoughts were heard; that we were anticipating consequences. Many people experienced that 'aha' moment, when they suddenly realized how their processes looked through the eyes of the people who worked with their output."

Bucknell University:

Integration through conversation

The University Relations division at **Bucknell** (PA) is housed in one of Lewisburg's landmark mansions, a 10-minute walk from the center of the main campus. That's far enough for the people in University Relations to refer to the central administration building as "up the hill." But until recently, they were separated from the central campus in at least one other way: They did not use the same administrative software system that united the rest of campus.

That changed recently when Universi-

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ty Relations performed an analysis of its software options and decided to switch to the same system as the rest of the institution. SunGard SCT Banner (www.sct.com) had been in place for years at Bucknell, so UR would be joining a user community that had long ago decided how it wanted to configure the system. Unfortunately, the university's strategic planning process at that point was not suited to serve as a framework for

integration, so the Information Services & Resources division (ISR) and the team working on the Banner project developed an alternative planning method—a framework far from IT-centric.

A plan based on conversations. "Our division's plan has to respond to everybody else's plan," explains Gene Spencer, associate VP for Information Services and Resources. "So we regularly engage the campus community in many conversations. What do you want to achieve over the next five years? How could your work be easier if only technology didn't get in the way? We also carry on conversations through three advisory committees, a Web leadership group, and the president's staff."

Cross-unit cooperation. The credibility and collaborative relationships that this ongoing dialogue generated set the stage for the UR implementation of Banner. "We set it up as a *campus* project aimed at solving problems for University Relations," says Spencer. "At least half of the people working on it were not part of the UR Division. Two of the three major committees were led by people not in UR. One of the people who led the project works in Human Resources, and her director freed up her time so she could work on the UR project." What was ISR's role? "We position ourselves as a critical partner, not the owner of processes," insists Spencer.

Campuswide benefits. The result was not only a successful integration of University Relations into the campus mainstream, but benefits for the rest of the campus as well. It turned out that UR's interest in the capability of tracking personal and family relationships among constituents (which had obvious fundraising and alumni relations benefits) was also useful to *other* units on campus. Ironically, one such beneficiary was the ISR division itself, which gives accounts to faculty and staff children, but needed a more effective way to track parent-child relationships. The technology organization's belief in cross-unit cooperation had paid off in more ways than one.

▶▶ Lessons Learned: Accountability

Linda Delene, Provost and VP/Academic Affairs, Western Michigan University
Accountability is the driver; "How are we doing?" is the planning strategy

"We are putting in a student information system, but it is clearly much more than that. The goal is to improve the learning environment for the students with the use of technology, by accelerating or enriching learning," says Linda Delene, provost and vice president for Academic Affairs, **Western Michigan University**. (WMU recently acquired student information, portal, and business intelligence software from Sungard SCT (www.sct.com)).

To do that, she says, "We had first to demonstrate that the modules would be able to account for how we were spending our dollars more effectively. Better information leads to more transparency, which responds to the national push for more accountability. We ended up saying to ourselves, if we buy this package, we will be able to have greater accountability with parents, legislators, and students. Word of mouth among students is very powerful."

She continues, "We don't have a strategic planning process that I would call formalistic; rather, it is inclusive. We look at 'How are we doing?'—not at reams of material and shelves of documents. Our approach is opportunistic: given our problems, what are our opportunities? How can we increase the number of faculty, the quality of the student body, external research funding? With the championing by a new president, we were able to adopt this project, even in a difficult fiscal environment."

▶▶ Lessons Learned: People are Key

Jeffrey Bartkovich and Marie Fetzner, Monroe Community College
People—and the mix of people—are key

"The marriage of the mission of the college, strategic planning, and the college information technology plan," is how Jeffrey Bartkovich describes the IIS project at **Monroe Community College** (NY), where he is vice president for Educational Technology Services. The most recent fruit of that marriage is MCC's plan to convert from SCT Plus to SunGard SCT's Banner suite.

"By integrating all systems, you also integrate all people," says Marie Fetzner, assistant to the vice president, and Banner project manager. Her advice for those who will manage a project like hers: "Secure executive-level support right at the start. But make sure the operational decisions are made by a base of people who actually work with the system and know how its parts are interrelated. Involve a mix of people with technical savvy and those with functional expertise; make sure everyone knows the benefits. We also brought in people from other public and private institutions that had already implemented Banner to tell us how it supported their mission."

Seeing Through to the End

IIS projects, by their very nature, voraciously consume resources and monopolize people's attention. They are so demanding that they only succeed if they are successfully hitched to the driving goals of the institution. NVCC President Robert Templin is one CEO who understands the consequences of not seeing that big picture: "We are in the process of transforming the institution. If we don't succeed, we leave 25,000 people without an education." The upshot? If you want your project to cross the finish line, you'll have to achieve that kind of clarity. **CT**

John Savarese is a consulting principal with Edutech International (www.edutech-int.com).

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CAMPUS TECHNOLOGY

After six years of disconnects,
the networking giant's VoIP
strategy finally makes the grade
with universities.

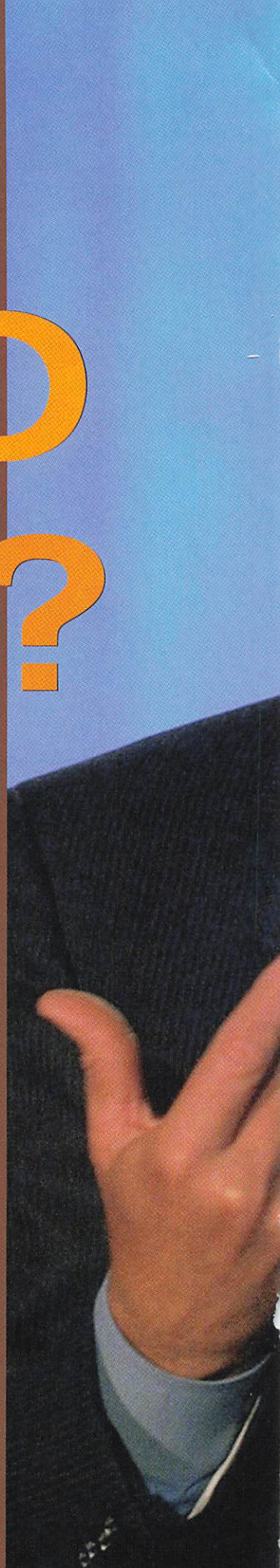
By Joseph C. Panettieri

can CISCO answer the call?

When Larry Levine reaches for his phone, he touches the future. As director of Computing Services at **Dartmouth College** (NH), Levine had a hand in one of the latest voice-over-IP (VoIP) rollouts in higher education. Indeed, Dartmouth this summer deployed VoIP phones from Cisco Systems Inc. (www.cisco.com) to its faculty and staff members. Over the next 18 months, the Ivy League school will deploy VoIP services to all of its students, representing 7,500 IP phone extensions.

Dartmouth isn't alone. After several false starts, hundreds of colleges and universities are dialing up VoIP in an effort to slash long-term telecom costs, ease management headaches, and consolidate digital traffic onto a single network infrastructure. Moreover, anecdotal evidence suggests most university VoIP rollouts involve Cisco Systems. "Cisco is clearly the most advanced and experienced VoIP vendor, no question," asserts Levine.

Adds Perry Hanson, CIO of **Brandeis University** (MA), which has 6,500 IP phones from Cisco, "They have many years of VoIP experience. Everyone told us voice-over-IP wasn't ready. But it is."





For years, Chambers has been outspending telecom rivals on VoIP R&D. The gamble may be paying off, but many colleges are still wary.

Cisco's customers evidently agree. The networking giant commands roughly 42 percent of VoIP phone shipments, according to Synergy (www.synergyusa.com), a Dallas-based consultancy and market research firm. Cisco sold more than 437,000 IP phones in the second quarter—easily outpacing competitors—and sales of such devices are roughly doubling annually.

But that wasn't always the case. Flash back to January 1998. *Titanic* was No. 1 at the box office, John Elway won his first Super Bowl, and Cisco CEO John Chambers was set to unveil a five-phase strategy for integrating voice, video, and data on IP networks. At the time, Chambers predicted that Cisco's convergence strategy would inspire massive customer migrations to VoIP networks by 2001. Like his peers at such rival firms as 3Com Corp. (www.3com.com), Chambers said VoIP would cannibalize long-distance toll charges and expensive plain old telephone service (POTS) in the late 1990s, thereby slashing overall telecom costs for universities and other vertical markets.

Many pundits believed Cisco would indeed dominate VoIP, emerging as the Ma Bell of IP telephones for corporations and universities alike. After all, Cisco commanded more than 50 percent of the network switch and router markets. And as for dominating the higher ed market, Cisco's roots in academia ran deep. The company was founded in 1984 by a small group of **Stanford University** (CA) computer scientists, and Stanford President John Hennessy serves on Cisco's board. Moreover, Cisco Chairman John Morgridge focuses most of his time on the education sector, promoting information technology as a means to empower students.

Busy Signals

Still, Cisco and its rivals flunked early VoIP tests. Time and again, Chambers directed that his own office phone be replaced with a VoIP system. But his mandates to Cisco's IT team went unfulfilled for several years due to hardware glitches, software bugs, wiring snafus, and the massive scope of Cisco's own telephone network, which served 40,000 employees during the height of the dot-com boom. (The company now has about 35,000 employees.)

VoIP also suffered disconnects outside of Cisco. Through the late 1990s, many corporate customers and universities balked at first-generation VoIP systems, because they lacked quality of service (QoS) features found in traditional phone systems. Many VoIP pilot tests were further delayed by the dotcom implosion, economic recession, and September 11 terror attacks. Skeptics said it was difficult to embrace VoIP—which typically costs \$1,000 or more per user when deployed down to the

desktop—without a proven track record for the technology.

“Not many people could justify an unproven phone system with so many economic and geopolitical unknowns clouding their financial vision,” recalls Jill Cherveney-Keough, director of academic computing at **New York Institute of Technology**, a college with campuses on Long Island and in Manhattan.

Even so, Chambers wasn't ready to unplug Cisco's VoIP push during the recession. While rivals such as Nortel Networks Inc. (www.nortelnetworks.com) and Lucent Technologies Inc. (www.lucent.com) stumbled with accounting scandals and a heavy dependence on the decimated telecom carrier market, Cisco calmly outspent its adversaries on research and development. Consider the scorecard: In its fiscal year 2002, Cisco pumped \$3.3 billion into R&D, down a moderate 13 percent from 2001. In stark contrast, according to their companies' annual reports, Nortel and Lucent spent \$2.2 billion and \$2.3 billion on R&D in 2002, down 31 percent and 34 percent, respectively, from 2001.

Before and during the economic slowdown, a few VoIP pilot programs from Cisco and other major vendors quietly took flight. The first wide-scale university deployment came in August 1999, when the **University of Arkansas at Pine Bluff** deployed a \$4 million converged network using Cisco's CallManager gear. Dozens of similar Cisco and

rival rollouts followed. By 2002, the **University of Guelph** (ON) was the first in Canada to implement a fully converged IP network.

Answering the Call

To date, most universities have only given VoIP a look during some sort of critical turning point—such as the dedication of a new building or when a legacy PBX nears the end of its practical use.

“As a technology, VoIP is ready now,” says Dartmouth's Levine.

“But you should move when the time is right for your own institution. If you are looking at replacing an expensive PBX and your IP network is in good shape, now might be the time to begin planning for it.”

In Dartmouth's case, the school purchased its previous phone system from AT&T (www.att.com) in 1988 and upgraded it to Ericsson (www.ericsson.com) in 1994. Fast forward 10 years, and the college was eager for a modern phone system that offered staff, faculty, and students on-screen directories, message-waiting indicators, and the ability to use wireless notebooks as phones. “For all of these reasons, VoIP made a lot of sense for us,” says Levine.

And Hanson at Brandeis warns against the technology-for-technology's sake factor: “Don't put in VoIP because it's cool. You should consider VoIP when your old PBX nears retirement.” Indeed, Brandeis had an 18-year-old telecommunications switch before migrating to Cisco's VoIP phones in mid-2003. The previous system “was a hodgepodge solution that the university

Getting Ready for VoIP

Before embarking on any VoIP deployment, take the following four steps:

1. Determine the existing traffic levels on your data and voice networks. This will help to determine your QoS (quality of service) requirements and bandwidth needs for an IP telephony (VoIP) network.
2. Detect and resolve existing network issues such as bottlenecks in certain LAN segments.
3. Develop an accurate picture of your current network topology to uncover potential routing and switching issues.
4. Establish a baseline of current network performance in order to measure future performance and determine whether you're meeting your goals.

Source: NEC Unified Solutions Inc.

had cobbled together and the original vendor would no longer support,” recalls Hanson. “We suffered two crashes and that usually doesn't happen with PBXs, so we knew it was time to make a move.”

Plenty of Alternatives

All of this is not to suggest that other telecom vendors are not offering quality VoIP solutions of their own. Market researcher Synergy confirms that Cisco leads the VoIP market, but plenty of universities are deploying VoIP systems from Nortel, Avaya Inc. (www.avaya.com), 3Com, and other suppliers. Just ask IT administrators at Australia's **Ballarat University** (Victoria), which remains firmly committed to Nortel as it transitions from PBXs to VoIP.

“We already had five Nortel Meridian PBXs,” says Jeff Dowsley, manager of ICT (Information and Communication Technology) Strategy and Planning at Ballarat. “We chose Nortel because they had an evolutionary path from traditional PBXs to IP-based services using their Internet Trunk Gateway. This gave us an easy path to VoIP without the need to establish Call Managers and the like, which would have blown the budget.”

In fact, part of Nortel's appeal is the company's extensive PBX experience

Five Reasons to Worry

Before signing on the dotted line, make sure your proposed VoIP system doesn't suffer from these shortfalls:

1. Lack of 911 accessibility
2. No “switched-loop attendant” console
3. No “blind transfer” call-forwarding features
4. Limited analog ports for modems, credit-card machines, etc.
5. Limited conferencing features

Source: Gartner Inc.

married to its growing VoIP expertise. Consider the background of Frank Shepherd, Nortel's director of IP Telephony and Engaged Business Applications. The 22-year company veteran amassed PBX expertise for nearly two decades and spotted the VoIP opportunity in 1997. "My team mastered the dial-tone world and began assessing VoIP more than six years ago," says Shepherd. "Now, we've got a full product line and a network of partners ready to assist with deployments."

And carriers such as SBC Commu-

with low-cost VoIP services. Vonage, a privately held startup, is among the residential VoIP leaders, with 250,000 customers. It's unclear how much of a push the company intends to make into the university marketplace.

How to Plug In

Regardless of which supplier a university chooses, VoIP rollouts require plenty of prep work and network reconfiguration. Brandeis, for instance, installed UPS (uninterruptible power supplies) from emergency power sup-

pliment Cisco partner with telecom and VoIP experience.

Other universities aren't as fortunate. At Australia's Ballarat, a local Nortel channel partner "didn't have any field experience" installing and configuring Nortel's VoIP solution, which "caused a few delays before we could go into full production," recalls Ballarat's Dowsley. Nortel's Shepherd points out that more and more VoIP integrators are entering the market, but concedes that early voice-over-Internet deployments—up until 2002 or so—suffered from a lack

“Brandeis installed uninterruptible power supplies (UPS) in more than 100 wiring closets prior to VoIP rollout because VoIP phones need emergency power during brownouts and blackouts.”

nications (www.sbc.com), for instance, are getting into the act: SBC now offers multimedia communication solutions based on VoIP equipment from Nortel. Faced with falling demand for traditional phone services, SBC and other telecom companies—AT&T, MCI (www.mci.com), Qwest Communications (www.qwest.com), Verizon (www22.verizon.com), and others—have aggressively pushed into the VoIP market this year. Those telecom giants also face heated competition from startups such as Net2Phone (www.net2phone.com) and Vonage (www.vonage.com), which typically target small businesses and residential customers

plies designer American Power Conversion (APC) Corp. (www.apc.com) in more than 100 wiring closets, prior to rolling out VoIP. The reason: Unlike traditional phones, VoIP phones need emergency power during brownouts and blackouts. The university also embraced power-over-Ethernet, a standard that sends low-voltage electricity from wiring closets to desktops, over network connections. This negates the need to plug every VoIP phone into a wall outlet.

Although Brandeis' deployment proceeded without a hitch, CIO Hanson warns about possible trouble spots. In particular: It's difficult to find skilled VoIP consultants and integrators who have multiple projects under their belts. Brandeis overcame that obstacle via a campus/vendor partnership with Verizon Communications' consulting arm, a

of trained consultants on the street. Even so, Ballarat's Nortel VoIP system took only a few days to install, and provided immediate benefits. "Universities tend to be fluid in their organizational structures," notes Dowsley. "With VoIP, staff can now pick up their phones, walk to a new office, and plug them in. You don't have to program these changes into a PBX. With phone lines treated as data lines, we can add services easily as demand rises and falls."

Four Steps to Success

Not sure where to start with VoIP? According to a spokesperson for NEC Unified Solutions Inc. (www.necunifiedsolutions.com), a major integration firm with voice-over-Internet expertise, savvy university telecommunications administrators should take the following four steps before deploying a VoIP system:

1—Size up traffic. Determine existing traffic levels across the data and voice networks. This will help to develop QoS (quality of service) requirements and bandwidth needs for a converged VoIP network.

Know Your Options

A sampling of major VoIP product suppliers:

Avaya Inc., www.avaya.com

3Com Corp., www.3com.com

Cisco Systems Inc., www.cisco.com

Lucent Technologies Inc., www.lucent.com

Nortel Networks Inc., www.nortelnetworks.com

2—Fix outstanding problems. Detect and resolve existing network issues, such as bottlenecks in certain LAN segments.

3—Set network topology. Develop an accurate network topology picture to uncover potential routing and switching issues.

4—Baseline IP performance. Establish a baseline measurement of the IP network's current performance in order to measure future performance.

Experts maintain that skipping the four steps above can lead to massive

to deploy VoIP systems that achieve "five nines" reliability, asserts Purani.

Still, clarity, delay, and echo problems can also undermine VoIP systems. *Clarity* refers to the clearness of a voice signal. Many voice quality testers use two algorithms: PSQM (Perceptual Speech Quality Measurement) and PAMS (Perceptual Analysis Measurement System) to determine and troubleshoot the clarity of a voice signal. By contrast, *delay* is the time it takes for a voice signal to travel from the caller to the recipient. Network routers and

Coming of Age

Despite all these potential complications, there's no denying VoIP's growing popularity—even with students. "The first thing students wanted [from the VoIP system] was a wakeup call service," recalls Brandeis's Hanson. "So we had one of our computer students write a program in XML." One popular option is a recording of the university president imploring students to wake up. Brandeis students also praise the systems' corporate directory feature, which allows them to quickly find

“At Ballarat University, staff can now pick up their phones, walk to a new office, and plug them in.”

setbacks because VoIP performance is difficult to predict.

"On an enterprise level, network infrastructure plays a huge role in the efficacy of a VoIP rollout," says Brian Maroldo, technical director at NYIT. "Audio and video, unlike typical network applications, are extremely sensitive to loss and delay. From core to edge, the network needs to be set up properly to implement voice-over-Internet."

Recent history proves Maroldo's point. Many early VoIP networks suffered from unplanned downtime, and didn't achieve "five nines" (99.999%) availability, concedes Viswas Purani, director of Emerging Technologies and Applications at APC. (In layman's terms, "five nines" availability is less than 5.26 minutes of unplanned downtime per year.) Yet many early VoIP systems delivered only "three nines" (99.9%) availability—or about nine hours of unplanned downtime per year. If that doesn't sound so bad to you, consider losing your phones for nine hours during peak enrollment periods, major fundraising campaigns or campus emergencies. Fortunately, recent upgrades to VoIP hardware and software have largely resolved such reliability concerns and it's now possible

switches can increase delays and thereby reduce call quality. Finally, *echo* is the sound of a speaker's voice returning to his/her ear via the same telephone. This is often caused by an "electrical mismatch" between the trunk line and phone line, according to NEC Unified Solutions, which examines and troubleshoots networks for clarity, delay, and echo issues.

Security has also emerged as a critical factor undermining VoIP deployments. Just like traditional computer networks, VoIP systems are susceptible to viruses, worms, Trojan horses, packet sniffing, IP spoofing, and other types of data attacks. In fact, according to one senior IT executive of a major Wall Street firm, that company lost both its computer networks and VoIP systems during a 24-hour virus outbreak in early 2004.

To avoid such setbacks, Cisco recommends that customers secure their VoIP systems much the same way they guard traditional IP networks. These steps include deploying "stateful" firewalls and intrusion detection systems, (which keep track of the state of network connections), locking down Simple Network Management Protocol, turning off unneeded network services, and disabling unused network ports.

and dial any student, faculty, or staff member listed in the directory.

Looking ahead, some schools are now testing wireless (Wi-Fi) VoIP phones, but two CIOs from East Coast universities report that early models have a few bugs and tend to be expensive—\$800 or more per user. Still, prices for VoIP phones should spiral downward as network standards ensure interoperability and competition in the marketplace. "In two to three years, you'll see VoIP phones for sale in Wal-Mart and other stores," predicts Hanson.

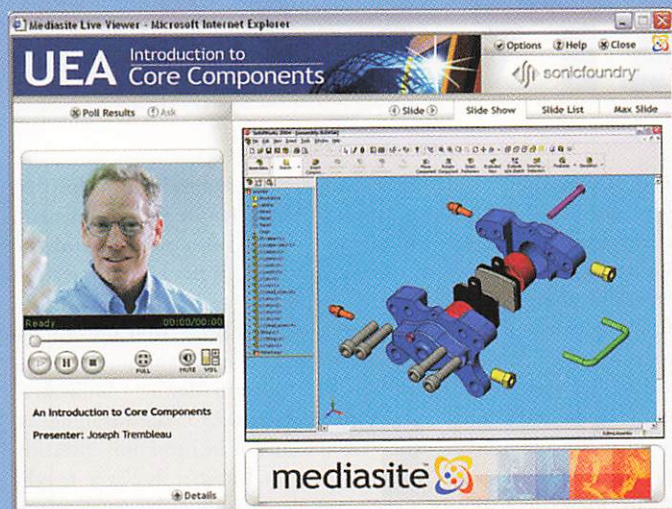
In fact, the future is already here. Staples (www.staples.com) recently agreed to carry VoIP-related networking equipment from Cisco and Vonage. Similarly, Best Buy (www.bestbuy.com) will offer AT&T's residential VoIP phone service, dubbed AT&T Call Vantage, in its 628 nationwide stores and online this fall. When the deal was announced in August, Best Buy indicated that it would continue to expand its lineup of VoIP networking products. The question is: With consumer expectation rising, can campus expectation be far behind? **CT**

Joseph C. Panettieri has covered Cisco, the networking industry, and Silicon Valley since 1992.

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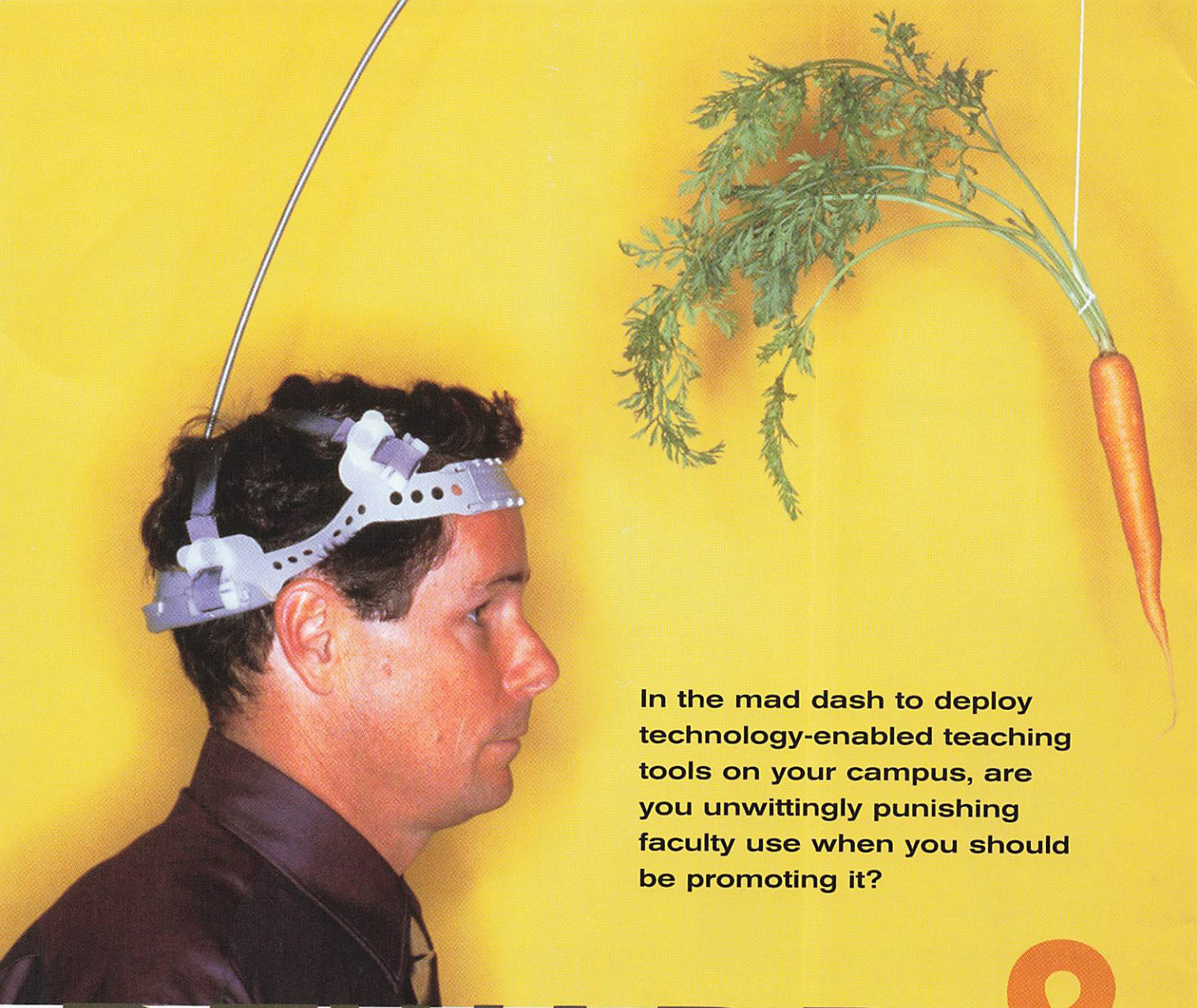
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In the mad dash to deploy technology-enabled teaching tools on your campus, are you unwittingly punishing faculty use when you should be promoting it?

REWARD &

By David Starrett



It is the end of November, and Joe Faculty has just filed his Record of Service for tenure at Middle USA State University. Joe is pretty confident he will be tenured; after all, Middle USA State is a teaching-oriented campus, and Joe has done a lot to enhance his teaching with innovative techniques. He has a lot of service to his credit and a comfortable amount of scholarship and professional development in the record.

Now it is early May the following semester, and Joe's chair calls him into the office.

He is sympathetic, but he informs Joe that his application for tenure has been denied. While Joe had a substantial record, he explains, much of his teaching innovation was via technology use: PowerPoint to enhance lectures, course Web sites to enhance classroom activity and provide supplemental information, innovative assignments designed to take advantage of the vast amount of information instantly accessible on the Internet. Joe even taught a class completely online. His service and scholarship involved technology compo-

nents, as well. And he published a couple of papers on innovations in technology-enabled teaching (TET).

Ironically, it was that very technology use that was behind Joe's failed tenure application. Sure, Joe's teaching evaluations were good, but they weren't top-level, the department chair advised him. Obviously, Joe was told, this was a result of technology use: The time he spent on the use of TET—an as yet unvalidated tool—simply took away from his more serious teaching endeavors. The time involvement also detracted from his scholarly research; he made fewer scientific discoveries and received no grant money because of it.

Now, in late August, as Joe leaves the campus to teach at a community college, his department chair gives him some parting advice. "Joe, if you go back to a four-year university, be sure to spend more time on real scholarship and teaching, and don't waste too much time with this technology fad; maybe then you can get tenured!"

While Joe would certainly get tenured at many institutions today, at other campuses—especially four-year institutions—this story isn't so far-fetched. As a significant component of the academic environment, classroom presentation technology and innovation in other technology-enabled teaching has rushed onto the scene in a relatively short number of years. As such, the ben-

and even the radio (for remote instruction) have impacted education many times over the centuries. Each time, the use of those technologies was no doubt accompanied by growing pains. Each time, there were probably faculty who were done a disservice by the inability of the academy to keep up with the changes in teaching technology. Fortunately, each time, faculty and the academy survived.

The TET-Savvy Campus

Today, some campuses have been reasonably effective at responding to the need for effective faculty development around technology-enabled teaching, and many hire instructional designers to address the issues of quality and pedagogical training and support. Tempered by recent economic crises, budgets at many institutions have responded to the need to keep up with the constantly advancing hardware and software upgrades and versions. And at these schools, through incentives (particularly in promoting development of online distance learning courses), faculty have been encouraged to incorporate technology into the learning environment. Incentives may be used for developing technology-enhanced teaching materials, receiving training, or sharing materials with others. Stipends, too, are inducement for faculty. Course release time, professional development monies,

Faculty was unable to get tenure because the system was simply unable to place value on the effort and outcome around TET; unable to weigh the value of the result versus the time and effort put in. This may be, in large part, because administrators at many institutions have not yet looked at the payoff of TET, or asked the right questions concerning its use. Faculty can help them address such concerns.

Faculty Concerns

Clearly, these are challenging times for institutions of higher education and their faculties. Budgets and staffs have been stretched to the maximum in recent years, and teaching time, dollars, and resources are tight. For the most part, though, higher education (and certainly K-12) faculty embrace the use of the growing array of TET tools, even as their use places additional demands on time and attention. Yet, faculty are now not just concerned about being penalized for using the technological teaching tools, they are looking for reward and recognition for incorporating the new techniques into the teaching learning environment. The list of concerns is broad and diverse. If your own institution has not yet been faced with the following concerns, it soon will be. Your responses to these concerns—tailored to your individual campus—may spell success or

CONQUER

effits, cost of development, and cost of implementation are just beginning to be explored. Still, while those efforts move forward, the need to recognize faculty effort and reward and incentive involvement with instructional technology is both immediate and real. Without such recognition and encouragement, higher education might actually find itself thwarting the advancement of learning in the 21st century.

Fear of TET

Certainly, new "technologies" such as the Gutenberg press, the blackboard,

and additional forms of support are some other common types of incentives, as are needed hardware and software.

Still, the faculty *rewards* process has perhaps been less able to keep up with the rapid pace of technology-enhanced teaching innovations. In higher ed, the promotion, tenure, and merit process, in particular, has been slow to respond to these examples of teaching improvements and the related scholarship of teaching and learning. Faculty across many US campuses complain that there are no TET points for tenure, and that, in itself, is a sore point. Joe

failure for technology-enabled teaching in the coming months and years.

Support. More than ever before, teaching faculty are looking for the provision of technical and professional development support in the use of TET tools. They want to know: Is the campus providing training opportunities, both technical and pedagogical? Is appropriate hardware and software provided and kept up-to-date? Is there sufficient expertise available on campus, either via training or among colleagues? Faculty also want to know that there is financial support for the tools,

and a budget sufficient to ensure that the support continues. Finally (and perhaps most importantly), is there moral support for faculty technology use? Is the campus truly behind the initiatives, and is that publicly apparent to faculty and other constituencies?

Incentive. Today, faculty want to know what incentives exist to encourage instructors to incorporate technology into the teaching environment—and details count. They ask: Is the incentive in the form of stipends or release time? Will incorporating technology provide additional choices in class form or type, schedule slots for the classes, or classroom location and type? Will tech-enhanced or even online courses provide increased earning opportuni-

ties, such as summer teaching assignments or course overload potential? to plagiarism and cheating? What is the penalty in teaching effectiveness? How are issues like class size and workload impacted? Are they taken into account and adjusted appropriately? More philosophically, but most importantly: How is something crucial like critical thinking affected?

Autonomy. Of vital interest to your faculty is the issue of how much control or say a faculty member has over the tech-enabled teaching environment? Does the permanence of the material reduce the freedom a faculty member has to stray from the material during classroom instruction? Does technology-enabled teaching leave a “paper trail” that may not always be comfortable? Moreover, does the

member or school not being compliant.

Copyright. To encourage faculty use of TET tools, it's essential to clarify the rules for copyright in the digital age, and questions are everywhere: Is fair use the same as in the non-technology-enhanced classroom? How is copyright permission obtained? How does the new copyright act (TEACH Act) impact teaching with technology? (For a TEACH rundown, please head to www.ala.org/washoff/teach.html.) Who polices it? What are the risks to the faculty member or school not following the new copyright law? How does one know if teaching materials are compliant with the Act?

Ownership. Because some faculty fear a loss of additional earning oppor-

“Joe, to get tenured, spend more time on real scholarship and teaching, and don't waste time on this technology fad.”

ties, such as summer teaching assignments or course overload potential?

Reward. Any of the incentives above could also be considered a reward. Additionally, a key concern is whether or not remuneration will be made through the standard rewards structure, i.e. promotion, tenure, merit, or other performance-based compensation systems. Furthermore, will the use of technology to enhance teaching and learning be appropriately recognized and rewarded not just with (or instead of) compensation, but with promotion or job security? Will changes in workload due to technology incorporation be recognized and considered in the rewards process?

Penalty may be a top-of-mind issue with faculty, even if you don't suspect it is an issue on your campus. Of greatest concern is the risk or cost—actual or implied—of incorporating technology into teaching and learning. But there are myriad other issues as well: What is the penalty for copyright or ADA non-compliance? What is the risk or penalty to school or to instructor with regard

to plagiarism and cheating? What is the penalty in teaching effectiveness? How are issues like class size and workload impacted? Are they taken into account and adjusted appropriately? More philosophically, but most importantly: How is something crucial like critical thinking affected?

Workload. When it comes to TET, faculty have myriad concerns and want to know if it will increase workload (and the expectation of carrying greater workloads), or if, in fact, it will ease workload. And again, faculty are wary: Will changes in workload be recognized by faculty and/or administrators?

Accessibility. Here, problems can crop up before administrators think through issues, and concerns are many: Are computer-based teaching materials accessible for students or instructors with physical or learning disabilities? How does the Americans with Disabilities Act impact teaching with technology and/or are teaching materials compliant with the Act (Section 508)? Faculty want to know who, precisely, is responsible for maintaining compliance, and what the risk is to the faculty mem-

ber or school not being compliant. ber or school not being compliant. tunities if intellectual property rights are turned over to the school, one of the most urgent questions for faculty moving to TET, is: Who “owns” technology-enhanced teaching materials? If a faculty member creates technology-based teaching materials, does he or she have sole ownership, shared ownership, or no ownership of the materials?

Quality. Because TET has been around a relatively short time, both faculty and higher education administrators are looking for evidence that the tools are, in fact, effective. How is the quality of tech-enhanced teaching materials monitored, measured, or assessed on your campus? Who will monitor it and how will quality control be handled? For more on quality assessment, see *The No Significant Difference Phenomenon* (www.nosignificantdifference.org), *The Technology Evaluation Sourcebook* (rcgd.isr.umich.edu/tlr/TechSbk.pdf), and *PBS TeacherSource* (www.pbs.org/teachersource/teachtech/research.shtm).

Plagiarism is an important issue,

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regardless of technology. But plagiarism may be an even greater risk or problem in the tech-enhanced teaching environment. On your campus, do students feel it is easier to plagiarize and/or easier to get past an instructor using TET? How can this activity be detected? Faculty want to know how TET plagiarism can be stopped, or at least reduced or minimized. What's more, they ask: How much of this activity is intentional, and how much is innocent? For more on plagiarism with TET, go to: Plagiarism.org (www.plagiarism.org), Plagiarized.com (www.plagiarized.com), Plagiarism resource list (www.web-miner.com/plagiarism), and "Probing for Plagiarism in the Virtual Classroom," *Syllabus* magazine, May 2003, (www.syllabus.com).

Cheating is, of course, similar to plagiarism. Yet, with TET, how big a problem is it? Do students feel it is easier, or easier to get away with? Does the Internet provide greater opportunity through information access, communication, and anonymity? Again, the questions are: How can it be detected, and how can it be stopped or minimized? Furthermore, will the administration back instructors in detecting and punishing it?

Reality. Finally, the questions around day-to-day use of TET are many: What is the reality of using technology to enhance teaching and learning? Is it for everyone? How is classroom personality (of instructor) affected? What is the technology comfort or competence of a given faculty member? How does the shift from teacher-centered teaching to student-centered teaching impact a faculty member? Does the faculty member have to believe in "the cause," and what happens if he/she doesn't?

Changing Attitudes

In 1999, an action team at **Southeast Missouri State University** (MO), composed of a faculty member from each school or college on campus, was tasked with creating a white paper on

the issue of rewarding and recognizing the value of technology-enabled teaching. The team found that there were few studies of the problem, and so created a document (cstl.semo.edu/itfrr) designed to aid campus promotion-and-tenure decision-makers in fairly evaluating faculty dossiers.

Frankly, it is hard to say whether the document has had much impact at Southeast Missouri State. Via failed promotion applications and comments on promotion-and-tenure reviews, there is anecdotal evidence that the system still has not placed appropriate value on the use of technology to support teaching and learning. (Where promotion and tenure is not part of the process, such as in the two-year and K-12 environments, there is still concern that the role of technology in enhancing teaching and learning is not being adequately recognized and rewarded. On the other hand, K-12 has perhaps been the first arena to start incorporating expectations of use of technology in teaching and learning in job descriptions, the hiring process, and even the performance review process.)

Why is expectation of TET use not part of the higher ed promotion-and-tenure process? Probably because ours is a system that makes it harder to incorporate into the process new definitions of the role of the faculty member. And maybe because of the issue of intellectual property rights, which has arisen as an important component of the rewards process for many faculty. A review* of the intellectual property rights policies addressing technology-based teaching materials at 30 well-known institutions of higher education found that, at most campuses, faculty own the material and that is stated in general policy or a policy interpretation. When it is otherwise, the distinction of ownership comes down to the existence of a work-for-hire clause; a specific contract or statement that assigns those rights to the college or university. But a prevailing reason for not acknowledging the importance of TET in the promotion-and-tenure process may simply be the slow process of attitude change in higher education.

What can be done to balance the scales for Joe Faculty?

Push the associations. From the broadest perspective, national organizations such as the American Association for Higher Education (www.aahe.org), Educause (www.educause.edu), or the American Association of Colleges and Universities (www.aacu.org) should be encouraged to more effectively take up the cause; currently none of them focus on this issue very heavily.

Discuss and explore. Closer to home, open discussion of the issues is essential. A TLT Roundtable (www.tlt-group.org) approach with inclusion of action teams and ad hoc groups can effectively involve a broad base of the campus community in the conversation; ideas harvested from these discussions can have significant impact.

Scholarship. Encourage faculty to make use of scholarship opportunities through organizations such as MERLOT (www.merlot.org). Instructional design support can help maximize effectiveness of TET materials.

Follow best practices. "The Seven Principles of Effective Undergraduate Education" (www.tltgroup.org/programs/seven.html), as defined in the tech-enabled environment, can be a great starting point for incorporating effective design in TET.

Increase awareness. Administrators, IT staff, and faculty can change attitudes by being aware and contributing. Certainly, faculty can encourage other faculty to address the rewards process and help make administrators aware and willing to forge small changes at first. And finally, the IT community can have a marked impact on both faculty and administrators by educating, helping, and supporting. **CT**

*David Starrett is Director of the Center for Scholarship in Teaching and Learning, and Interim Dean of the School of University Studies at Southeast Missouri State University. *Request a copy of the property rights policy review by sending an e-mail to starrett@cstl.semo.edu.*

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MPEG-4 and the New, 'Flat' World

With MPEG-4, you can expect to access and display multimedia information from myriad live sources while the information is also accessed remotely—no matter what type of connectivity is in use.

WE LAUGH WHEN we look back at the notion of a “flat” world—the world as it was perceived before Columbus proved it otherwise. But today, even faced with all the wonders of the Internet and other powerful networks, we often find ourselves cursing a world that isn’t flat. Flat, to us, would be a world where all network “receive” locations have the same level of transport speed and the same means of connectivity. In short, flat would be great.

Why Isn't Our New World 'Flat'?

As with the Internet, it's impossible to make a ubiquitous network infrastructure totally flat. That's because, generally, not all receive locations have the same level of transport speed or the same means of connectivity.

Today, high-definition still images, motion images, and audio are typically sent over separate channels and with different coding schemes. For example, today's codec may utilize one form of compression for motion video, while another compression algorithm for still images is being interspersed when space is available. The protocols are generally proprietary and fixed in data rate between the sender and all receivers. This means that the user is stuck with proprietary technology at each end.

Yet, the receiving end of the stream must be able to dictate the connection in different ways. That means that if the receiver is a codec providing images to a video projector in a lecture hall, a large amount of bandwidth is required—even while a student taking part at home with a lower-speed connection can see the same image (albeit with fewer pixels). To put it



more plainly, the receiving codec makes a connection only at the codec's desired baud rate. Previously, to make our simultaneous lecture hall/home study scenario possible would have required data-rate conversion and multiple encoding devices, with one device per transmitted data rate/protocol. But that was before MPEG-4.

MPEG-4 to the Rescue

MPEG-4 offers the ability to provide various data rates to match the receiving codec demands, and the ability to display. It allows each receiving device to make use of different speeds based on the size and quality of the image to be presented, and bandwidth

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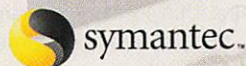


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available. No additional equipment is required in the transmission path; rather, the decoder utilizes the bandwidth available and needed, based on the receiving device's capabilities. To illustrate, the difference might be tantamount to seeing images full-screen on a laptop (XGA), versus seeing them on the color screen of a cell phone (sub VGA).

What does this advance mean to campus technologists, faculty, and students? What makes MPEG-4 such an important element in multimedia delivery? Simply this: Using this form of streaming, the instructor can access and display multimedia information from servers and other live sources at the room's control center, while simultaneously, the multimedia information can be made available to persons in remote locations, irrespective of the type of connectivity in use.

Interestingly, from a purely technical perspective, MPEG-4 has been compared to and considered an upgrade of MPEG-2. And in truth, MPEG-4 can offer the same image and sound quality as MPEG-2. But here's the difference: with MPEG-4, the needed band-

Mbps. Furthermore, some information channels, such as HTML images, need only a few thousand bits per second. So, just where will MPEG-4 find its home? MPEG-4 has the capability to effectively utilize whatever bandwidth is available between the sender and the receiver. And as bandwidth is clearly a constraining factor—and more and more we are moving to an all-digital system—MPEG-4 augments and may well replace MPEG-2 in the future. Multimedia images will be enabled not only in the living room but anywhere a cell phone or computer can be used, wired or wirelessly.

Where's the Magic?

The magic lies in the "scheme" of things: Unlike MPEG-2, which follows the old scheme of sending static images of the entire scene one after another, MPEG-4 is an object-based encoding scheme. With MPEG-4, individual objects that make up the image or sound are created and sent with location and timing information for the display. At the decoder, these objects are then reassembled and presented, based on the require-

When 'bleeding-edge' MPEG-4.10 transmission over IP networks turns into standards-based products, the real excitement will begin for AV/multimedia on campus.

width can be reduced by as much 50 percent, for the same quality. In other words, by replacing MPEG-2 with MPEG-4, the sender can double the number of channels being sent over the same bandwidth.

In fact, with the new MPEG-4.10 AVC (Advanced Video Coding) standard being readied for prime time, manufacturers are now creating open and standards-based codecs that will ultimately simplify the encoding and the decoding of streams of multimedia information at varying baud rates. The form factor for this new capability may be hardware or software within a PC, or may be a stand-alone appliance. Like most technology today, cost, functionality, and ease of use will become the deciding factors in determining which system is used and in which environments.

But let's talk more about this new standard....

Looking at the Standard

In 2003, the ISO standard designation MPEG-4 Part 10/AVC (Advanced Video Coding) was developed and approved for the broadcast television industry. MPEG-4 (also known as ITU-T H.264) was seen to be the next step beyond the high-definition (HD) TV MPEG-2 standard. But high-definition TV requires 19 Mbps, while a standard-definition (SDTV) picture requires only 4

Mbps. That means that if the display system has the capacity for many colors, levels of brightness, depth of rendition, and motion handling at XGA resolution, then a higher baud rate signal will be required. However, if the display device is a browser on a dial-up connected computer, then the baud rate requirements would be considerably less.

You may be asking: Hasn't all this capability been possible before MPEG-4? The answer is yes, though with the systems prior to MPEG-4, this would have required one encoder or translator for each delivered baud rate transmitted. The cost and complexity of using and managing such a system have been barriers to the success now expected with MPEG-4.

Demise of the Scan/Standards Converter

Today, coding and decoding technology has fixed protocols and baud rates as required by the internal transmission systems. Selecting transmission using MPEG-2 or H.323 means the decoder must be matched to the coder with protocol and baud rate. Therefore, viewing an MPEG-2 image on an H.323 codec requires some means of standards conversion. Even if the coder and decoder are compatible and only the baud rate is different, some means of external

baud rate conversion is still required. MPEG-4 proposes to remove the need for scan/standards/rate converters by enabling the receiving decoder to use only the bandwidth it has available and is necessary for the display.

Impact on the Smart Classroom

Thus far in our discussion, we've been looking at the original intent of MPEG-4 for the broadcast industry. But MPEG-4 will have pronounced impact on the world of education as well—no wonder higher ed and K-12 are also exploring its use! Currently, AV/multimedia trials of MPEG-4.10 transmission over IP networks are being conducted. And it is as these trials of somewhat bleeding-edge technology are turned into standards-based products, that the real excitement will begin. The driver may well be the ability to provide HDTV and SDTV broadcasting via DSL technology and cell phones, but understand this: The residual benefits of these developments will be educational uses. Educators will have achieved the means of delivering instruction without regard for time or place. With MPEG-4, students will be able to see and hear information on a wired PC or wirelessly connected laptop, PDA, or other mobile device (with the appropriate resolution and bandwidth con-

straints), while the same information is presented with a high-definition image locally. All this while your campus is utilizing available bandwidth more efficiently. Remember: MPEG-4 can send equal picture quality in one-half the bandwidth needed by MPEG-2.

Think, too, about the impact of the replacement of that H.323 codec, the set-top box, or the tuner in the classroom VCR/TV. Replace this "box" with a new MPEG-4 low-bit-rate encoder/decoder to send and receive video and audio to and from remote sites. Add a camera and microphone to a smart classroom system, and the room will be enabled to record what is presented and transmitted to receivers at the receiver's selected baud rate. No additional equipment required. [For more about MPEG-4, visit www.m4if.com and www.mpeg.org.] **CT**

Dave Kaun is chief technical officer for Elert & Associates (www.elert.com), technology and training consultants to the education, government, and health care sectors. He is a former director of Telecommunications and Networking at the University of Wisconsin-Stout, and has also enjoyed a distinguished career in public television.

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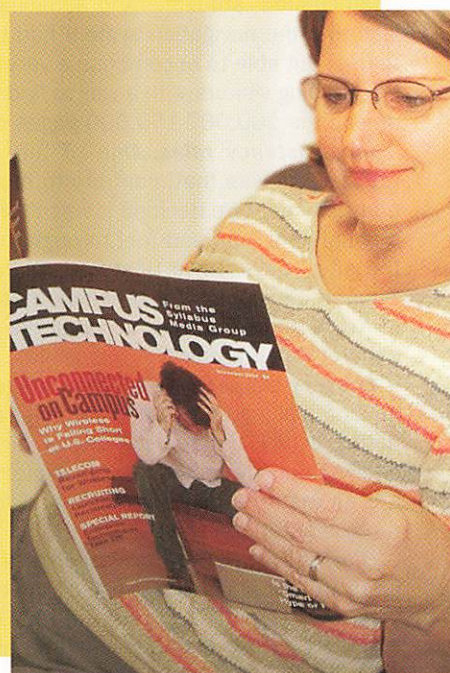
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Reading Between the Lines

By John Savarese

What begins as a straightforward portal makeover for RIT ends up as a hard look at usability and branding. Follow the numbers to see why.

When the **Rochester Institute of Technology** (NY) launched its initiative to "spruce up" the institution's Web portal, little did administrators know the effort would eventually evolve into a systematic review. But as the process moved forward, fundamental questions kept cropping up: Why were some site visitors frustrated when they tried to navigate through the site? Who was the primary audience? Most importantly, was the Web site communicating the special character of RIT?

Study reveals surprises. The Institute decided to commission a usability study of its existing site, recruiting actual prospective students, a parent, and others to carry out scenarios. Among other things, notes Diane Barbour, Chief Information Officer, "We found that we were using terms that were familiar to us, but that many visitors didn't understand—like what it means to be a 'matriculated' student." And administrators soon realized that the navigation system had to be both simple to use, but able to encompass a very complex university, providing visitors with a way to find what they wanted among the 100,000-150,000 pages of content.

Inconsistency rules. One of the more interesting realizations was that, contrary to more widely accepted practices, "We decided it wasn't necessary to have a consistent look and feel through the entire depth of the site," says David Hostetter, Director of Customer Support Services. "Each college has a unique sense of itself, and we wanted to preserve the trademark of each of those areas."

Imagery supports strengths. Imagery turned out to be a critical ingredient, and administrators felt that the nature of RIT justified the use of high-tech Macromedia Flash animations. After all, explains Hostetter, "We are an institute of technology, and a premier photography institution in the world."

Blazing brand. But the challenge that came to dominate the redesign effort was: How can we make the Web site "scream the brand" of RIT? Features such as "Career Center" and "Success Stories" were added to

emphasize how the Institute prepares students for life-long professional careers (the special quality that RIT administrators believe sets it apart) and to echo the aspirations of the students who select the school.

Assessment and re-examination of the Web site continues; messages evolve as the needs of constituents change. RIT Information Technology Professor Evelyn Rozanski and her students will be involved in future usability engineering studies of the site, as will the Institute-wide Web Committee. "Our goal was to develop a process, not just a new design," says Hostetter.

1 Career Center and Success Stories.

(Rotating). How can you miss with an eye-catching visual and lead-in to a story about a prominent RIT graduate, randomly selected from an archive every time you visit the site? Research shows that students who choose RIT have definite ideas about where they want their careers to go, and they want to see examples of alumni who have made it in their fields. Career Center lets them match their career plans with the right major, and informs them about employment prospects.



2 For/About.

With drop-down menus, a lot of navigational options are compressed into a small space, but they're still uncluttered and easy to grasp. That's because the Web site captures the two main ways that the information on a site can be organized: by who the visitor is (alumnus, prospective student, faculty, etc.), or by what topic the visitor is interested in ("About"). The "About" topics have drop-down menus that are activated by





mouse roll-over, providing an easy way to glimpse the next level of info available. Visitors don't have to click down and then back up to see what comes next.

3 myRIT opens the door to a vast array of information available to insiders such as current students, faculty, and staff. Students can check grades and register for classes, powered by the campus information system. For fun and general information, the Rochester weather forecast and live views from the RIT Web Cam invite visitors to check out the weather for themselves, and site navigators can also view a calendar of goings-on—even a dictionary word-of-the-day. (A recent example: "Flaneur: loafer.")

4 Guest View. The "Guest View" button lets non-community visitors wander through non-confidential parts of the portal system and get a taste of what the campus has to offer. (Many portal-equipped systems lack this courtesy to visitors—or keep it tucked away.) RIT provides more powerful portal accounts to prospective students and alumni.

5 Campus Directory. Ever been frustrated wandering around a school's site trying to find out how to contact somebody? Directory look-up information is so basic that it ought to be found

right at the top level—and it is at RIT. If your institution has a policy against publishing such information on the Web, consider telling a visitor that fact *before* he wastes time scouting around. Then suggest other means your visitors can use to contact people at your institution; a general number, at the very least.

6 Flash Slide Show. (Live rotation.) Yes, flash animations are controversial—so much so that some users install software that disables Flash on every site they visit. RIT came up with an effective compromise, however. This central illustration does dissolve into a running slide show while the page is viewed. But far from being just generic campus-brochure photography, each shot nails a specific personality trait of RIT, and text is matched with the image to further illustrate the point. What's more, the Flash graphics are well-behaved; they stay within a frame and don't scoot distractingly around the page. Most importantly, the information in the Flash slide show, while complementary to the page, is not essential for navigation. And RIT provides a button that lets visitors turn the animation off with a single click. **CT**

John Savarese is a consulting principal at Edutech International (www.edutech-int.com)

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WHAT'S HAPPENING IN TECH SECTORS

Briefs

NEWS ■ GOIN' GLOBAL, MATE. eLearning systems giant WebCT (www.webct.com) is expanding again, adding a "down under" office in Sydney, three senior-level execs, and five new resellers. Meanwhile, the roster of new WebCT Vista international higher ed customers grows—the **University of Vienna** (Austria), **University of the Aegean** (Greece), and **Nagoya University** (Japan) have recently come on board. Other institutions—the **University of Birmingham** (UK) for one—are upgrading their WebCT systems to meet the demands of eLearning programs. ■ **CONTENT EXCHANGE TAKES OFF.** WebCT and MERLOT (www.merlot.org), a free online learning resource, have partnered to give WebCT users access to 10,000 indexed learning objects, thus enhancing the learning content exchange. The MERLOT Web site will be optimized for WebCT users, and the WebCT materials will be augmented by MERLOT, say WebCT spokespeople. ■ **CENTRALIZE, CENTRALIZE.** Penn State University's (PA) Agricultural Economics and Rural Sociology (AERS) department has selected the Web-based service desk product FootPrints from UniPress Software (www.unipress.com), to centralize its IT Help Desk. AERS deployed Footprints to track and manage all incoming IT support requests from AERS staffers, faculty, and graduate students. The AERS ITS Help desk staffers can now track and manage calls via trouble tickets, quickly refer to FAQs for answers, and utilize a knowledgebase to collaborate on problem resolution. ■ **SMALL ENVIRONMENT, BIG COLLABORATION.** Educational technology firm and provider of collaboration software, DyKnow (www.dyknow.com) has partnered with the **University of Richmond** (VA) to increase "wired" collaboration between students and faculty via DyKnow Vision collaboration software. Despite the small liberal arts setting, says DyKnow President Laura Small, "Richmond is setting up the perfect environment to show that liberal arts subjects can benefit greatly from DyKnow's collaborative features." ■ **M&A ■ PAPERLESS PARTNERS.** Jenzabar Inc. (www.jenzabar.com) an eLearning system provider, has partnered with document imaging

group Feith Systems and Software Inc. (www.feith.com), allowing Jenzabar to offer imaging, workflow, and records management to colleges and universities using Jenzabar's software—part of its Total Campus Management (TCM) system. ■ **HOW TO BOOST ENROLLMENT.** To strengthen its enrollment management technology (EMT) product line, higher ed communications and recruitment technology provider Hobsons (www.hobsons.com) has completed the acquisition of Academic Engine (www.academicengine.com), an Internet software development firm showcasing a natural language question/answer system. Hobsons spokespeople note that the merger creates an organization that can now "guide students from prospect to alumnus." The merger also adds 150 new higher education clients to Hobsons' 650. ■ **PEOPLE ■ TWO AGAINST INTRUSION.** Kenny Van Zant (formerly of Cisco Systems' broadband access team) and David Sikora (President/CEO of infrastructure software firm Pervasive Software), have been appointed to the board of directors of TippingPoint Technologies Inc. (www.tippingpoint.com), provider of networked-based intrusion prevention systems. ■ **SWITCHING GEARS.** Former Sun Microsystems exec William Malik has joined enterprise researchers Aberdeen Group (www.aberdeen.com) as VP of Technology Research, driving Aberdeen's CIO's Strategic Agenda research programs. **CT**

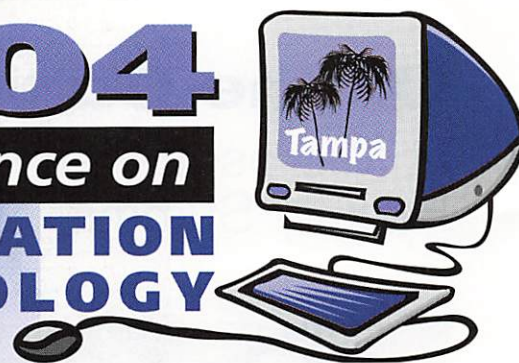
HOT PROSPECT

Hobsons' acquisition of Academic Engine creates an organization that can now "guide students from prospect to alumnus" via enrollment management technology and natural-language Q & A.

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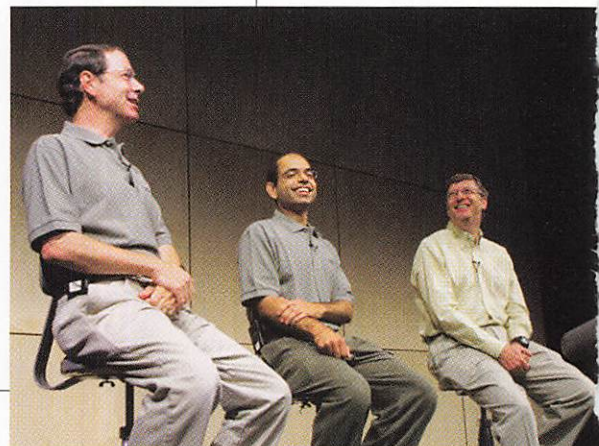
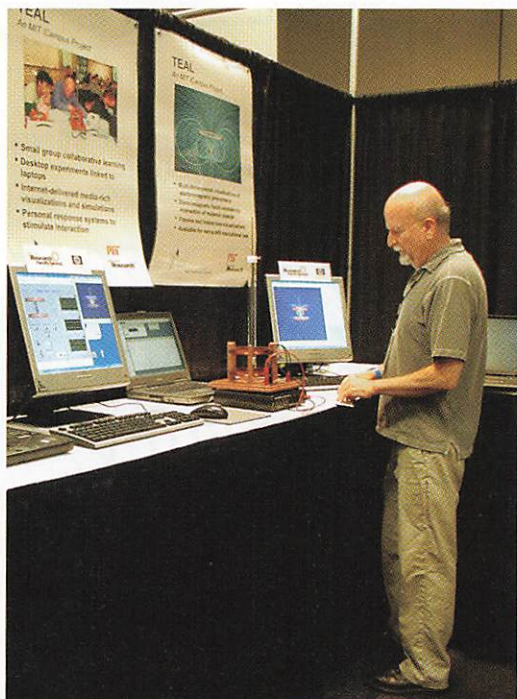
The League for Innovation's annual Conference on Information Technology (CIT) offers a diverse program and cutting-edge exposition exploring the intelligent application of information technology in community and technical colleges.



**FOR INNOVATION
IN THE COMMUNITY COLLEGE**

Campus Technology heads West with Microsoft and SAC

On the Cutting Edge at Microsoft Research's Faculty Summit



magic time at microsoft ▲

At Microsoft Research's 6th Annual Faculty Summit (research.microsoft.com/collaboration/university) in Redmond, WA, August 2, (left to right) Rick Rashid, senior VP of Microsoft Research, Sailesh Chutani, director of Microsoft University Relations, and Chairman Bill Gates Q&A'd with attendees. In his keynote, Gates told the audience, "It's hard to think of a domain that's going to change the world one 100th as much as advanced software will in the decades ahead." He added that, with their help, he hoped "we can really show how magic software is, and how it can improve the world." The summit was created by Microsoft Research to engage universities in cutting-edge research, with emphasis on the emerging computing environment, transforming science by computing, and advancing the computer science curriculum. It convened nearly 400 faculty from 135 higher education institutions in 20 countries.

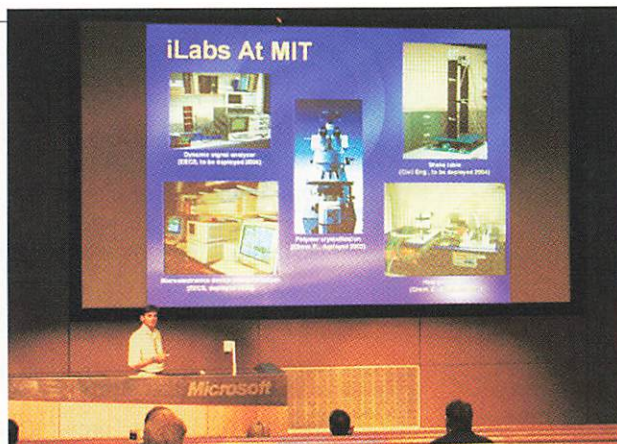
▲ demos, demos, everywhere ▶

The Summit's Demo Fest allowed close-up, hands-on interactions with the technologies, including an ambitious group of iCampus projects from **MIT**, a 3D sketching tool from the **University of Minnesota**, and advanced classroom presentation software developed by a **University of Washington** professor. Above, John Belcher shows how **MIT**'s TEAL may be utilized in Studio Physics courses; right, UW's Richard Anderson demos Presenter.

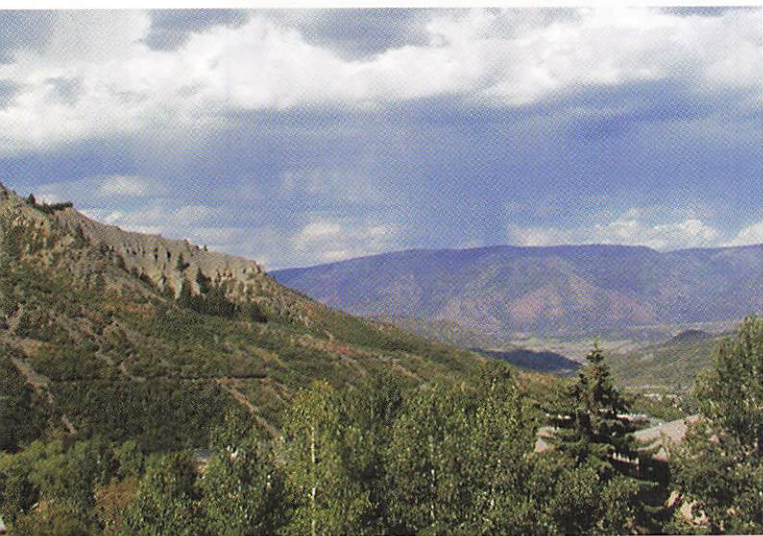


inside the summit sessions ▶

Giving Summit attendees an inside glimpse of current research initiatives and programs, several campus project teams and Microsoft Research staff delved into areas as diverse as wireless sensor networks, Web services architecture for online labs, grid computing, interactive photos and video, and gender equity in IT. Right, Jesus del Alamo presents MIT's iLabs projects.



Big Landscapes, Big Ideas at the Seminars in Academic Computing (SAC)



◀ rocky mountain high ideals

Looking at the SAC conference setting from the rooftop tent in Snowmass (left), it's not hard to understand why, every summer for more than 30 years, higher ed IT leaders have met in Colorado to share ideas and guide new director-level professionals.

SAC, now an Educause affiliate (www.educause.edu/conference/sac), has traditionally focused on executive leadership development. This year's conference was aimed squarely at CIOs—both seasoned execs and new directors—with strategic seminars for senior leaders, and sessions offering new tools for those just coming into the IT leadership role.

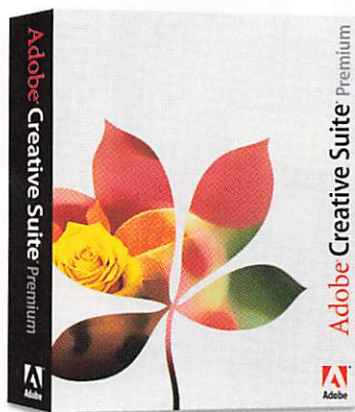
Each year, though the high-altitude venue offers a sense of retreat, those pesky “back home” concerns bubble up in the conference sessions. This year's heavyweight topics: security, IT alignment with institutional priorities, assessment, and the role of the university in the information economy. No surprise was the fact that accountabili-

ty and delivering technology programs on tight budgets were also recurring strategic planning themes. And in his opening address, Richard Detweiler (Distinguished Fellow of the Council on Library and Information Resources) maintained that technology development is easier than understanding the related cultural and organizational consequences of that development. He then offered a broad perspective on the leadership role of IT directors and the impact of institutional technology planning.

Conference sessions covered myriad topics and urged directors to bridge the gap between technology “concept” and communicating effectively with constituencies in order to integrate technology components to serve broader institutional goals. Says SAC Board Chair Joan Falkenberg-Getman, “The idea is to think strategically about how the topics will influence planning and direction.” **CT**

CT Solutions

The latest releases, services, and new product versions

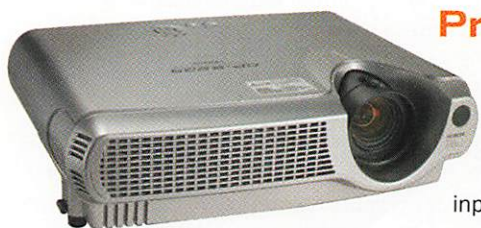
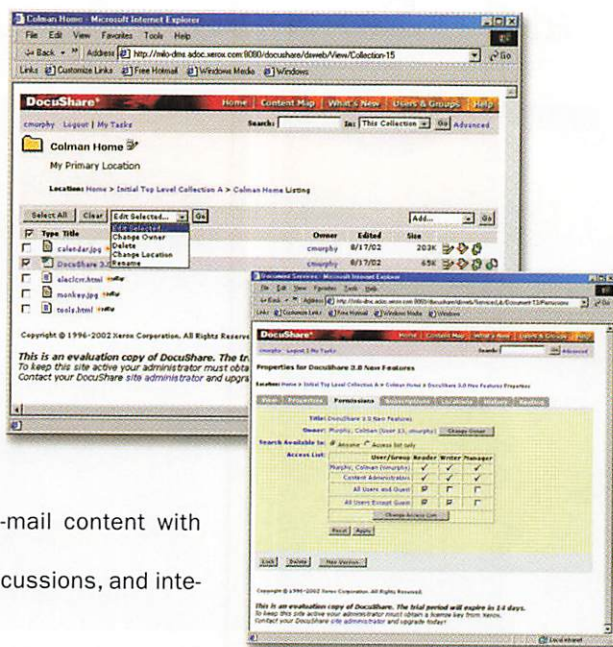


Design to the Nth Degree

From **Adobe**, *Creative Suite* is a complete design solution that enables the user to publish content for print and the Web—combining the latest versions of Adobe creative apps such as: *Adobe Photoshop CS* with *Adobe ImageReady CS*, *Illustrator CS*, *InDesign CS*, *GoLive CS*, and *Acrobat 6/0 Professional*. *Creative Suite* also supports a complete Adobe Portable Document Format (PDF) workflow and offers an assortment of robust educational resources as well as expanded support options. www.adobe.com.

Storage Galore

Xerox's DocuShare 4.0 now offers the *DocuShare Records Manager* module, which complies with government standards for storing and expiring records. With the updated 4.0 version which includes secure Direct Scan from **Xerox** devices, customers have a full end-to-end solution from capture to document management to final record storage. In addition, the E-Mail module adds collaboration capabilities: Users can e-mail content with attachments into *DocuShare*, store group e-mail discussions, and integrate with any mail system. www.xerox.com.



Projecting Confidence

The newest addition to **Hitachi's** LCD projector family, the **CP-S235** model provides numerous connectivity options, including one RGB and three video inputs and S-video. Weighing only seven pounds, the projector is HDTV compatible and the monitor output allows presenters to view the same projected image on an external monitor. **CP-S235** is perfect for larger presentations, say company spokespeople. www.hitachi.us.com.

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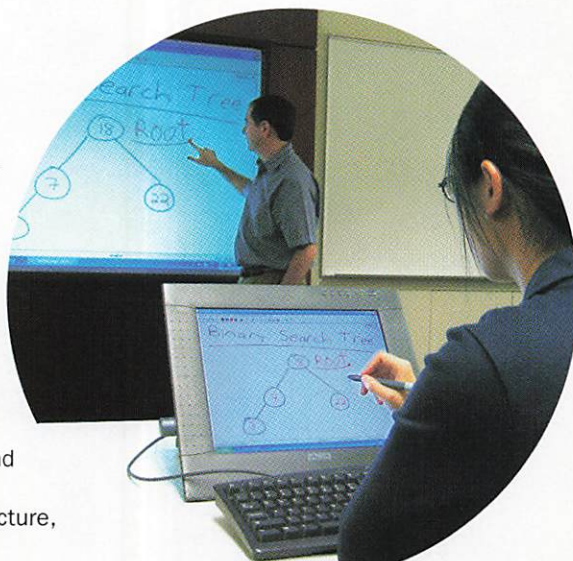
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The new **DyKnow Vision** software suite combines sound pedagogy with technology to create new flexibility in a teaching and meeting application. The suite engages students through note delivery technology, classroom monitoring, interactive tools, and lesson playback. Key benefits include: annotating capabilities, session collaboration, and sharing and customizing content. Institutions can leverage existing infrastructure, including wireless networking, desktop PCs, laptops, Tablet PCs, desktop tablets, LCD tablets, and interactive whiteboards. www.dyknow.com.



Say Cheese!

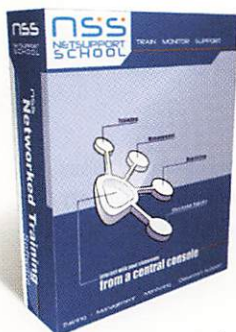
New, from **Epson**, the *PhotoPC L-410* compact, 4-megapixel digital camera incorporates continuous shooting, and records video clips. What's more, an added creative feature gives users the option to add "fun" frames to any photo. With its 3x optical zoom, 3x digital zoom, a 1.5-inch high-quality LCD screen, and Print Image Matching II technology, *PhotoPC L-410* is ideal for integrating quality images into the classroom experience. www.epson.com.



Multimedia on Wheels

The **Tandberg Mediaplace** is an integrated video communication system incorporating a set-top video setup with a high-resolution projector, DVD/VCR/audio system—all secured with a lockable Lexan cover panel. *Mediaplace* can join up to four video sites and one audio site with an embedded multi-site functionality. Additionally, there is a PC card slot for wireless LAN connection. www.tandberg.net.





Tools for School

As the use of computers and the Internet increases in higher ed, so does the need for managing the learning process in networked classrooms. With *NetSupport School 7.5* software from **NetSupport**, teachers are able to better instruct, monitor, and support students in such

environments. *NetSupport School* is a software-only classroom instruction, monitoring, and polling tool

that enables teachers to simply and effectively train students in the computer lab.

www.netsupport-inc.com.

Collaborate and Elaborate

Nortel's network-based application *MCS 5100* integrates voice, data, and video services enabling users to collaborate from almost anywhere. Students, faculty, and staff can share information in real time by using the whiteboard or even sending a Web page. Creating a connection to the network is as easy as using telephone, cell phone, PC, or other wireless device, say company spokespeople. Now, there's no excuse for showing up late at a meeting! www.nortelnetworks.com. **CT**

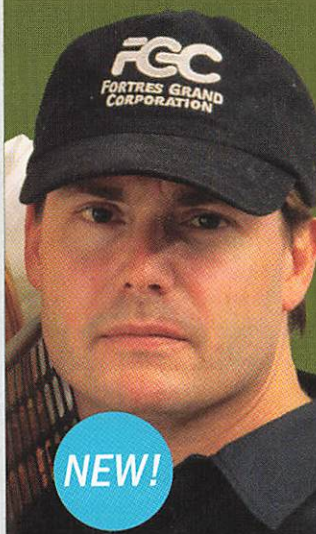
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Upcoming Events

October 2004

OCT 1 – 2, 2004

CCSC - Midwest Conference

Consortium for Computing in Small Colleges
(www.ccsc.org/midwest)
Kalamazoo College, Kalamazoo, MI

OCT 3 – 5, 2004

American Association of Collegiate Registrars
and Admissions Officers

AACRAO Technology Conference (2004)

*Implementing Technology in Student Systems
and Service*
(www.aacrao.org/tech04/index.htm)
Newport Beach, CA

OCT 8 – 9, 2004

CCSC - Northwest Conference

Consortium for Computing in Small Colleges
(www.ccsc.org/northwest/2004)
Willamette University, Salem, OR

OCT 10 – 12, 2004

Society for College and University Planning
SCUP North Central Regional Conference
(www.scup.org/calendar/index.html)
Minneapolis, MI

OCT 11 – 12, 2004

Miami University Center for Interactive Media
Studies (IMS)

2004 Interactive Media Forum

Creative Space/Digital Space
(student.sba.muohio.edu/ims/conference/index.html)
Miami University, Oxford, OH

OCT 15 – 16, 2004

CCSC - Eastern Conference

Consortium for Computing in Small Colleges
(justice.loyola.edu/ccsc04/)
Loyola College in Maryland, Baltimore, MD

OCT 19 – 22, 2004

EDUCAUSE2004

IT from a Higher Vantage Point
(www.educause.edu/conference/annual/2004)
Denver, CO

OCT 22 – 23, 2004

CCSC - Rocky Mountain Conference

Consortium for Computing in Small Colleges
(ecarey.uvsc.edu/ccsc)
Utah Valley State College, Orem, UT

OCT 24 – 27, 2004

NACAS 36th Annual Conference

National Association of College Auxiliary Services
(www.nacas.org/conference)
Orlando, FL

OCT 30 – NOV 2, 2004

The Council of Independent Colleges

2004 CAO/CFI Institute

*Collaborative Leadership:
Meeting Competitive Challenges*
(www.cic.edu/conferences_events/caos/index.asp)
San Francisco, CA

OCT 31–NOV 5, 2004

TDWI World Conference—Fall 2004

*Business Intelligence and Data Warehousing
Education*
(www.dw-institute.com/education/conferences/index.asp)
Orlando, FL

November 2004

NOV 1 – 5, 2004

E-Learn 2004

*World Conference on e-Learning in Corporate,
Government, Healthcare, and Higher Education*
(www.aace.org/conf/eLearn/Intro.htm)
Washington, DC

NOV 4, 2004

IDC Enterprise Forum

*Evaluating the Capabilities & Implementation
Options of On-Demand Computing*
(www.idc.com/enterpriseforum04)
Fairmont Hotel, San Jose, CA

NOV 5 – 6, 2004

CCSC - Southeastern Conference

Consortium for Computing in Small Colleges
(cs.furman.edu/ccscse/conference.php?year=18th)
Wofford College, Spartanburg, SC

NOV 7 – 10, 2004

League for Innovation in the Community College
2004 Conference on Information Technology
(www.league.org/2004cit/index.html)
Tampa, FL

NOV 15 – 17, 2004

EDUCAUSE Center for Applied Research

2004 Research Symposium

(www.educause.edu/ecar/events/2004/program.asp)
Hotel Del Coronado, Coronado (San Diego), CA

NOV 14 – 17, 2004

TechLearn

Exploring Learning and Technology
(show.techlearn.com/techlearn/V40/index.cvn)
Marriott Marquis, New York, NY

December 2004

DECEMBER 1 – 3, 2004

The Open Source Summit

*Open Source - Opens Learning:
Exploring the Impact of the
Open Source Movement in Education*
(www.opensourcesummit.org)
Scottsdale, AZ

DECEMBER 6 – 8, 2004

OSDI

Sixth Symposium on Operating Systems Design and Implementation

(www.usenix.org/events/osdi04)
San Francisco, CA

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Best Networking Strategies

From IU's Brian Voss, a networking line of attack for 2004-2005



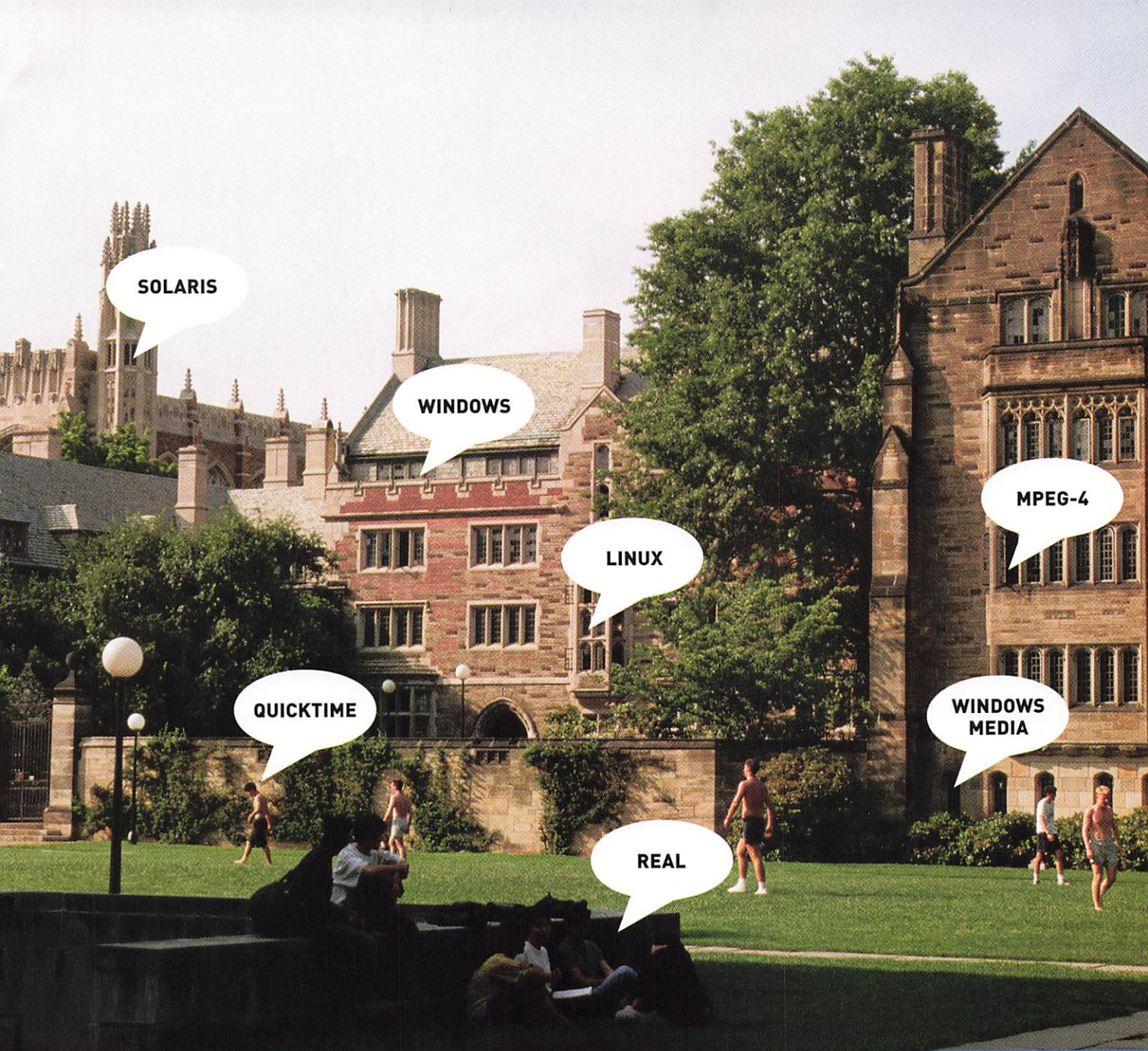
With nearly 20 years of leadership experience across the IT field, Brian D.

Voss, associate VP for Telecommunications in the Office of the CIO and VP for Information Technology at **Indiana University**, has the inside track on campus networking strategies.

In his current role in the executive leadership of IU's telecom organization, Voss has responsibility for voice, data, and video networking. He also represents IU in national and international high-performance, advanced networking initiatives including Internet2 and National LambdaRail (NLR), and is co-principal investigator on IU's TeraGrid project. Not surprisingly, Voss can offer solid direction to higher ed networking leaders. Right, his Top 10 best practices countdown.

To submit a *Campus Technology* 'Top 10 Countdown,' send your countdown and brief background/bio summary to mgrush@101com.com.

- 10** **VoIP "isn't soup yet." Wait and see, but continue to actively investigate the technology.**
 - Data networks aren't as reliable as voice
 - Let the applications emerge
 - Long distance may be the potential application
- 9** **Continue to deploy a 10-megabit pathway to the user's desktop.**
 - Internet apps cater to the weakest link
 - Allow a differential in desktop speeds
 - Handle streaming media with compression
- 8** **Extend the campus network to the Internet border.**
 - Globalization influences connectivity
 - Most traffic is to and from the external Internet
- 7** **Reach out to the high-speed research-focused infrastructures.**
 - Cyber infrastructure for R & D is critical to higher education
 - Build connections to Internet2/Abilene and NLR
- 6** **Build out your institution's wireless infrastructure as part of your network strategy.**
 - Wireless and mobility are common expectations
 - Try to establish ubiquitous wireless coverage
- 5** **Fiber to the desktop is not a good idea—don't upgrade throughout.**
 - Copper is cheaper than optical
 - Use fiber to the desktop in isolated cases
- 4** **Modem pools are dinosaurs. Get out of the biz of being an ISP.**
 - Encourage commercial broadband ISP services
 - Free up money from modem pools for other uses
- 3** **Town-and-gown wireless and broadband availability projects are worth some investment.**
 - Especially true in college towns
 - Get involved with the local community
- 2** **10-gigabit campus backbones should be in every CIO's one- to three-year horizon.**
 - Connections are evolving to higher speeds
 - The aggregate traffic going off campus is increasing
 - The time is now to begin planning for that next step
- 1** **Pay attention to network security—the most critical need facing CIOs and telecommunications officers today.**
 - Security problems sap time for other advancements
 - The security may have to override certain freedoms
 - Have one foot on the gas and one on the brake—a counterbalance. Don't stop completely and go nowhere, or barrel headlong over a cliff! **CT**



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